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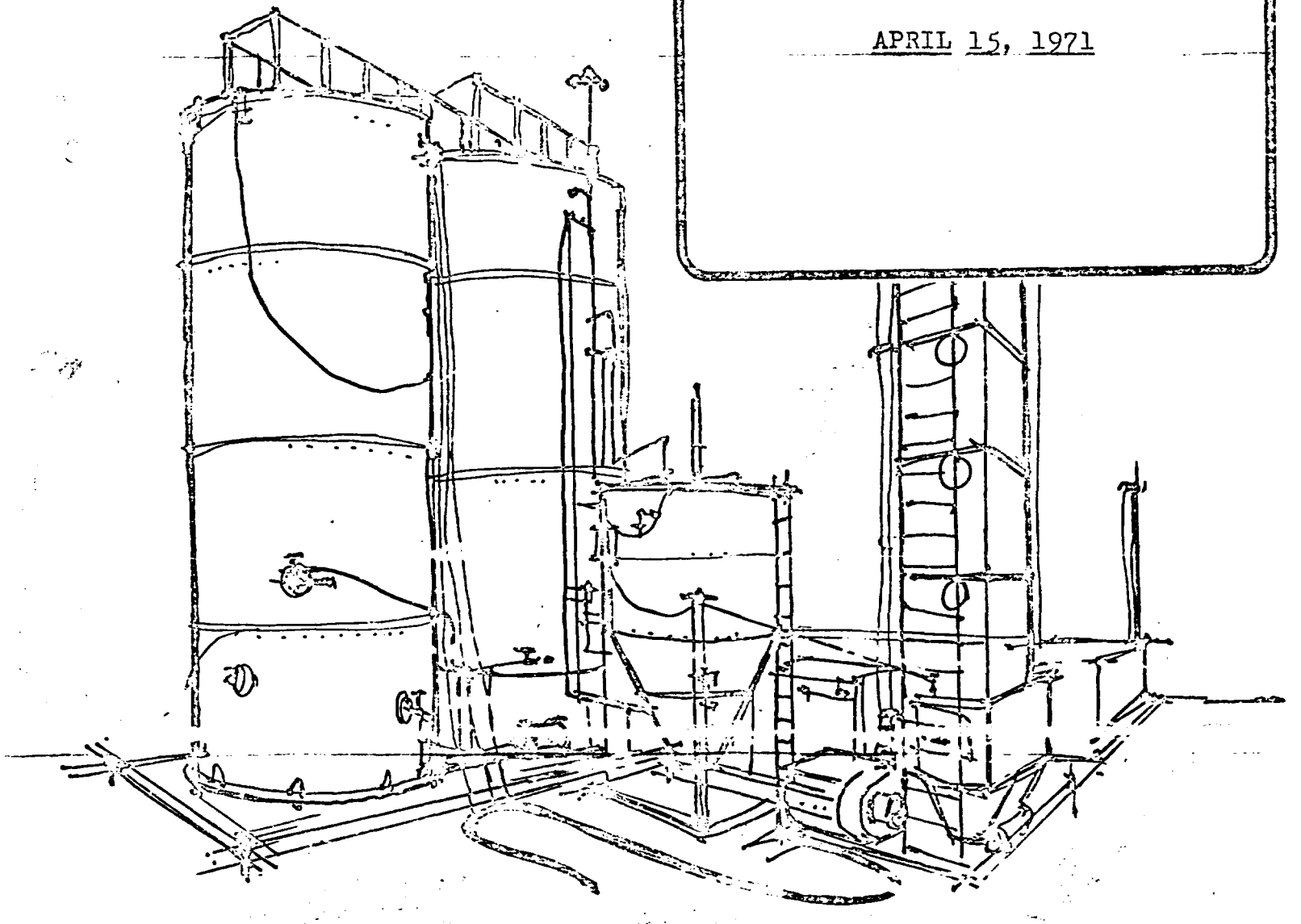
145421

WATER POLLUTION ABATEMENT PROGRAM

CERRO COPPER AND BRASS COMPANY

SAUGET, ILLINOIS

APRIL 15, 1971



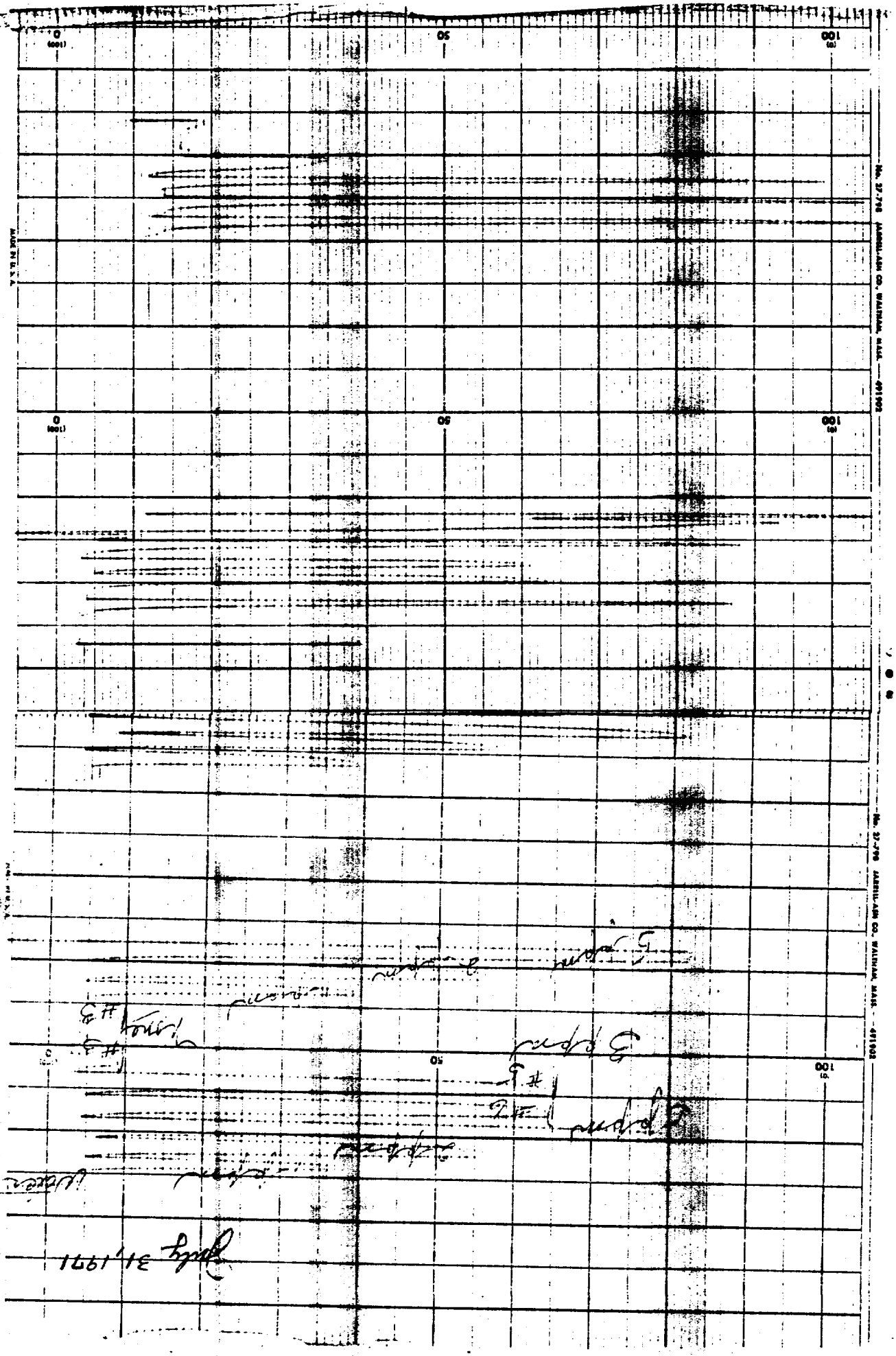
BIODIZE

Monsanto
BIODIZE SYSTEMS, INC

C311-1

510 Northern Boulevard, Great Neck, New York 11021, phone: (516) 466-5511

3-1611-1168-92 LITHO IN U.S.A.



Monsanto

Monsanto Biodize Systems Inc.
510 Northern Boulevard
Great Neck, New York 11021
Phone: (516) 466-5[illegible]

April 15, 1971

Mr. W. E. Dunnick
Cerro Copper and Brass Company
Sauget, Illinois

Dear Mr. Dunnick:

In accordance with the agreement between Cerro Copper and Brass Company and Monsanto Biodize Systems, Inc., we submit herewith a report of the results of our preliminary sampling and analysis program and a general outline of our proposed flow measurement work. Costs will be included under separate cover.

Yours truly,

Bruce C. Davis

Bruce C. Davis
Engineer, Prototype Plants

BD:rs

Monsanto
BIODIZE SYSTEMS INC.

PRELIMINARY SAMPLING AND ANALYSIS PROGRAM

APRIL 15 1971

Prepared by: Bruce C. Davis

Bruce C. Davis
Engineer, Prototype Plants

Approved by: Jerry L. Jones

Jerry L. Jones
Prototype Plants Supervisor

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SUMMARY

Grab samples and continuous samples were taken at various points in the plant and were analyzed for copper, zinc, cadmium and iron. The major sources of these metals were found to be the Slimes area, the Pond, the three Scrubbers, and the Tube Mill. These flows will be measured and concentrations of metals leaving the plant will be measured to make sure these areas represent the major sources of contamination.

OBJECTIVES

The objectives of this phase of the study were to:

(1) determine the magnitude of metal losses from the various sources in the plant and identify opportunities for conservation or recovery.

(2) propose an experimental plan and resulting cost estimate for the flow measurement work.

SAMPLING PROGRAM

A sampling program was set up with the listed objectives in mind. Table 1 and Drawing 1 give a description of the sampling points and their locations. Grab samples were collected from Stations 1, 2, 4, 6, 7, 10, 11, and 13A. These were taken on the 16th and 17th of March between ten and eleven in the morning, five and six at night, and at midnight. No flow was observed through Station 3 (Maintenance) and Station 5 (North Trunk).

Continuous samples were taken at Stations 6, 8, 9, and 12 and consisted of hourly samples taken with a slow pull continuous sampler. With this type of sampler several problems can occur that interrupt operation. During this study, operation was interrupted when the sampler became disconnected electrically and when the tubing became fouled. All samples were considered valid if a full sample (approximately 16 ounces) was obtained. All partial samples were discarded.

Grab samples were taken around the pond to determine the source of contamination in the pond water. Ten inputs were observed on site but they did not correspond to those listed on the Cerro sewer drawing. ~~The 6-inch overhead line does not appear to be present.~~ A 1.5-inch line flows to the pond from a tap on a hydrant valve in the same general area. A total of six samples were collected from this area (Drawing 2). Looking at the drawing starting counterclockwise from Station 7, the output, one sample was taken from

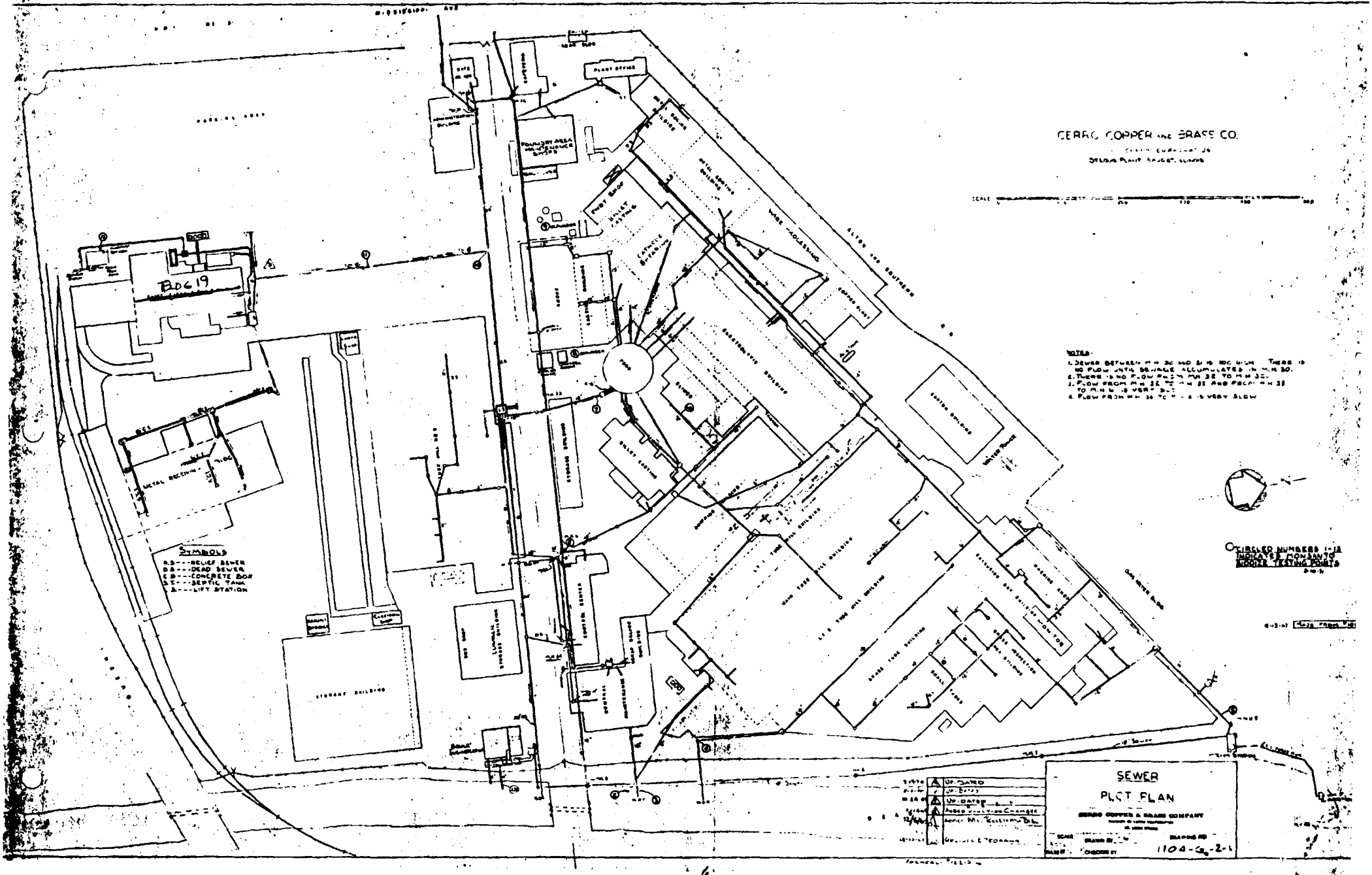
the two lines coming from the split on the corner of the billet casting area. A second sample was taken from the line crossing the slimes yard which does not necessarily flow as shown. Dye was injected in the split near the former billet casting area across from the shipping building. The dye did not reappear in the outfall to the pond. Of the two 4-inch lines shown, the eastern most one was not observed flowing and the western one was sampled.

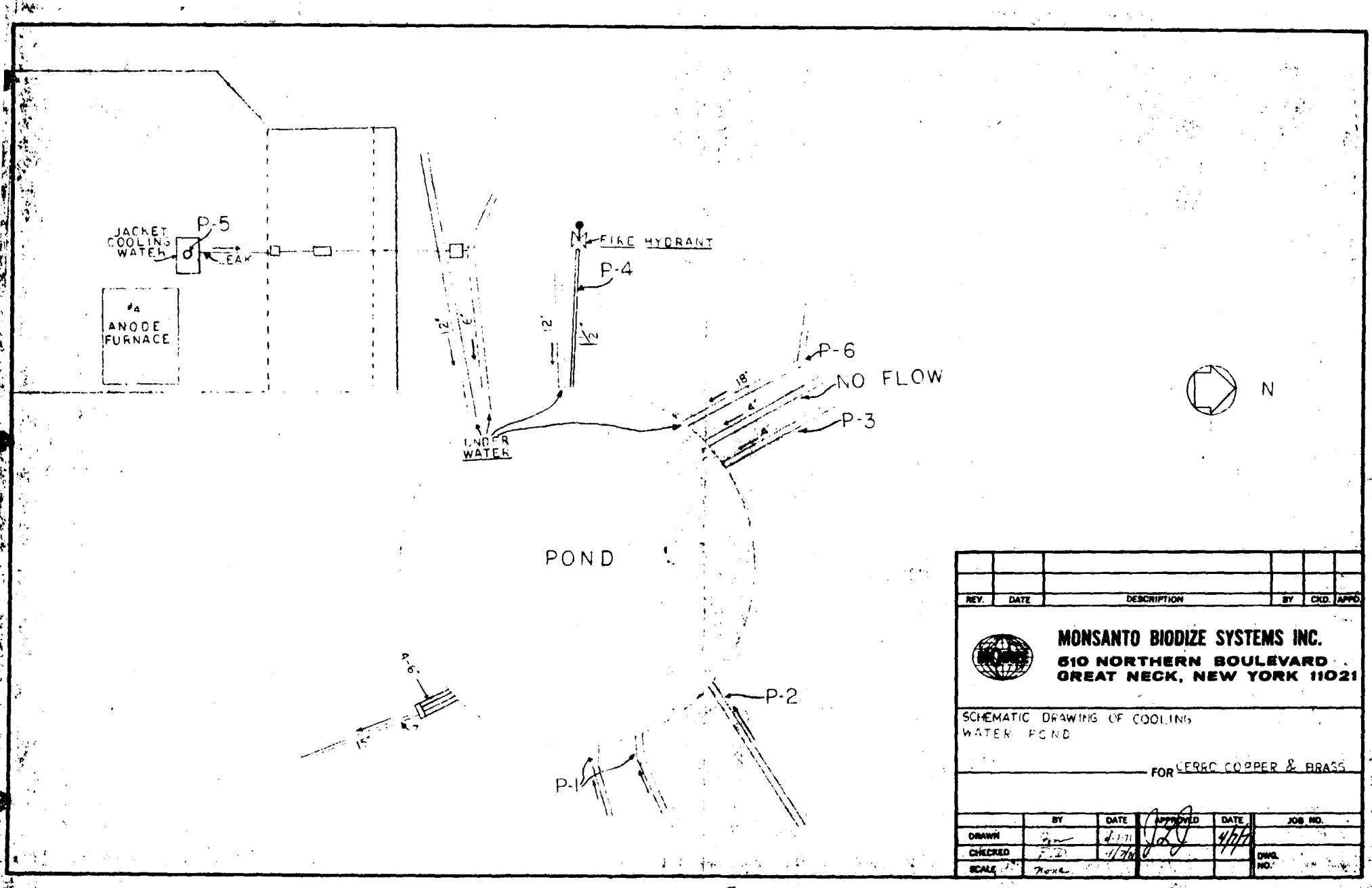
The next sample was from the 18-inch line which flows from the North Area and enters the pond under water depending on the level of the pond. An 18 inch variation in pond level was observed during this phase of the study. The 12-inch line was not sampled since it is covered by water until both furnaces are down.

The major hydralic input to the pond is from the anode furnace building. This is also the most poorly defined area on the drawing. The scrubber output off the #4 Anode Furnace goes through a holding tank in the building and reaches a sump and is pumped to the pond. The water from the #3 Anode Furnace scrubber could also be going to the pond. Dye was injected but no trace of the dye was found. A sample of cooling water off #4 furnace scrubber was taken and it was found that water leaks to the pond.

TABLE 1

Station	Location	Area	Suspected Water Contaminants
1	Manhole West of Control Center	Slimes, North Trunk	Metals
2	Outfall to Dead Creek	Tube	None
3	Outfall to Dead Creek	Central Maintenance	None
4	Outfall to Dead Creek	Tube Mill	None
5	Manhole #5	North Area	Oils
6	Slimes	Slime Tank	Metals, Acid
7	Southside Pond	Pond	Metals, Solids
8	Scrubber #4 Anode Furnace	Scrubber #4 Anode Furnace	Metals, Solids
9	Scrubber #3 Anode Furnace	Scrubber #3 Anode Furnace	Metals, Solids
10	East Side of Junction from Shaft Furnace	South Trunk Flowing East	Metals, Solids
11	Manhole on 10" Line from Shaft Furnace Bldg.	Shaft Furnace	Metals, Solids
12	Shaft Furnace Scrubber	Shaft Furnace Scrubber	Metals, Solids
13A	Incinerator Scrubber	Incinerator	Solids


CERRO COPPER AND BRASS CO.
BLDG 19
SYMBOLS
R.S.---RELIEF SEWER
D.S.---DEAD SEWER
C.B.---CONCRETE BOX
S.T.---SEPTIC TANK
L.S.---LIFT STATION
NOTES:
CIRCLED NUMBERS 1-12 INDICATE MONSANTO MONITOR TESTING POINTS
SEWER
PLOT PLAN
1104-C-2-1



REV.	DATE	DESCRIPTION	BY	CKD.	APPD.

MONSANTO BIODIZE SYSTEMS INC.
610 NORTHERN BOULEVARD
GREAT NECK, NEW YORK 11021

SCHEMATIC DRAWING OF COOLING WATER POND

FOR CERRO COPPER & BRASS

	BY	DATE	APPROVED	DATE	JOB NO.
DRAWN	[illegible]	4-1-71	[illegible]	4/7/71	
CHECKED	[illegible]	4/7/71			DWG. NO.
SCALE	None				

OBSERVATIONS

The samples were analyzed for metals at the pH of the given stream and a pH of 2.5. The procedures and equipment used have been described in Appendix I. The raw data has been tabulated by Sample point in Appendix II, pages 15 - 25. The average values have been tabulated by Sample point in Appendix III, pages 26 - 31.

S-1 West End of Control Center

Metal levels observed here can be attributed to wastes from the slimes area. Average metals levels for the acidified samples were as follows: Cu 7.6, Zn 8.4, Fe 18.5, Cd .29 *

S-2 Outfall to Dead Creek

This data represents background levels with the exception of zinc. Average levels of the acidified samples were: Cu .47, Zn 7.8, Fe <.1, Cd .03

S-3 Outfall to Dead Creek

No flow was observed through S-3.

S-4 Outfall to Dead Creek

This is a cooling tower addition as well as tube mill addition which appears to increase the iron level above that observed at S-2. Average acidified levels were: Cu .24, Zn 2.3, Fe 2.5, Cd .02

S-5 Manhole #5

No flow was observed through S-5.

* All values given in mg/l.

S-6 Slimes

This stream contains the highest concentration of metals in the plant. These samples were taken when the lead lined tanks were still in operation, they have now been replaced by stainless steel. Samples were not acidified here as the stream runs acid. Average levels observed were: Cu 53, Zn 28, Fe 5,930, Cd 1.1

S-7 Pond

Copper, zinc, and iron are consistently above the effluent standards here. The increases in copper and zinc at 6:00 P.M. on the 17th are probably due to scrubber input. Average acidified levels were: Cu 2.1, Zn 5.4, Fe 6.6, Cd .04

S-8 Scrubber - #4 Anode Furnace

Copper, zinc, and cadmium are all problems here. Definite peaks are observed in the data of all the metals at 5:00 P.M. and 11:00 P.M. on the 29th. (See page 18) All these metals are in solution at the stream pH. This is indicated by the close averages at the two pH's. Average acidified values were: Cu 57, Zn 17, Fe 2.6, Cd 3.5

S-9 Scrubber - #3 Anode Furnace

The results here are different from S-8. Much of the copper is insoluble at the normal pH of the stream. A similar peak occurs in the data at midnight on the 24th. (See page 20).

S-9 Average acidified values were: Cu 190, Zn 23, Fe 12, Cd 3.3

S-10 East Side of Junction from ~~Shaft Furnace~~ BLDG 19

There is a cadmium addition which is not accounted for. Otherwise the contamination is from the pond. Average acidified values were: Cu 14, Zn 6.0, Fe 4.5, Cd .42

S-11 Manhole on 10" Line from ~~Shaft Furnace~~ BLDG 19 Building

The values at S-11 are attributable to S-12. Average acidified values were Cu 56, Zn 3.0, Fe .43, Cd .05

S-12 Scrubber - ~~Shaft Furnace~~ MAIN FURNACE

Copper, cadmium, and zinc are problems here. The majority of the copper and zinc are soluble at normal pH. Most of the cadmium seems to be soluble at normal pH. Peaks in copper concentration, particularly, were observed at 8:00 P.M. and at 3:00 A.M. on the 15th and 16th. (See page 22) Average values were: Cu 142, Zn 5.2, Fe .25, Cd 49

S-13 Outfall to Dead Creek from Incinerator

These represent background levels.

CONCLUSIONS AND RECOMMENDATIONS

The pond (7), slimes (6), the three scrubbers (8, 9, and 12) and the tube mill (4) represent the major sources of contamination. The contamination at S-1 is attributable to the slimes area, contamination at S-11 is attributable to the ~~shaft~~ Mixer furnace scrubber and contamination at S-10 is attributable to the pond. The flows at points 4, 6, 7, 8, 9, and 12 will be measured and the streams analyzed. Stream 4 is not highly contaminated but will be measured due to high volume.

During the study two areas of the plant, the anode furnace building and Station S-1, were found to need flow definition. Some work was attempted with limited success. It is recommended that these areas be defined before the flow measurement work.

FLOW MEASUREMENT

The flow measurement program will be conducted in two parts. Costs will be included under a separate cover letter.

PART A: Sampling and Analysis

As was originally suspected the major areas of contamination are the three scrubbers, the slimes area, the pond, and the flow to Dead Creek from the mill. These are the flows that will be monitored. In addition, the flows entering the Village Sewer System will be monitored at Dead Creek and in front of the office building. Salt dilution techniques will be used to monitor flows - no permanent devices will be installed.

The weir at the slimes area will have to be modified. A larger basin in front of the weir will have to be installed with a baffle to reduce the turbulence. A sampling tap will also have to be installed in the line running from the holding tank to the sump off the #4 Anode Furnace. These modifications will be Cerro's responsibility.

A mass balance will be carried out for iron, zinc, lead, cadmium, and copper to make sure all major sources have been accounted for, and well water will be analyzed for background levels. Cerro will be responsible for the majority of the lead analysis. We will run spot checks on the lead analysis.

PART B: Sewer Tracing and Updating Sewer Drawings

Two areas of the plant still need flow definition - the Anode Furnace Building including the scrubbers and Station C-1.

Preliminary work led to no conclusion about the direction of flow in the case of the #3 Anode Furnace Scrubber waste. ~~The line flowing across the slimes yard needs to be traced.~~ In the case of S-1, flows are not necessarily as shown. No flow was observed in Manhole #3 down stream of S-1. This work will involve the use of dyes to clarify these problem areas.

The information obtained will be forwarded to Cerro Engineering for updating and correcting their sewer drawings.

APPENDIX I

ANALYTICAL PROCEDURES AND EQUIPMENT

ANALYTICAL PROCEDURES

Standard atomic absorption techniques were used. No concentration or extraction techniques were used. The standards were made up from 1,000 ppm reference standards and 1, 3, 5, 10, and 100 ppm were generally run. Due to the number of samples, care was not taken to read below 0.1 ppm for any metal except cadmium. Dilution was required for absorbance readings greater than one. Lead was not run because of the lack of a cathode tube sensitive enough for the low concentrations.

Readings were taken on the samples at the given stream pH and also at a pH of 2.5. Analysis for suspended solids and solid residues were not performed during this study. Ample quantities of samples remain and will be released to Cerro for any future work.

Minimum levels of detection were 0.1 ppm for copper, zinc, and iron and .02 ppm for cadmium.

EQUIPMENT

1. Atomic absorption spectrophotometer manufactured by Techtron, Model AA-100.

2. Cathode tubes manufactured by Jarrell Ash.

   a. Wave Lengths

cadmium	2,288	millimicrons @ 12 MA
zinc	2,139.6	millimicrons @ 15 MA
copper	3,247	millimicrons @ 30 MA
iron	2,483	millimicrons @ 30 MA

APPENDIX II

RAW DATA

LOCATION: WEST END OF CONTROL CENTER

DESIGNATION: S-1

DATE	TIME	COPPER *	COPPER pH2.5	ZINC	ZINC pH2.5	IRON	IRON pH2.5	CADMIUM	CADMIUM pH2.5	Lead pH
3/16/71	6:00PM	<.1	2.45	2.3	5.3	.4	12.1	<.02	.05	
		<.01	1.3	3.4	4.8	2.6	34	<.01	<.01	7.2
3/17/71	11:00AM	.1	2.25	1.5	6.7	.3	19.6	.05	<.02	
		2.03	1.6	1.96	4.2	<.1	3.5	<.01	<.01	7.2
3/17/71	6:00PM	1.85	9.5	8.2	10.7	.4	10.4	.22	.25	
		1.5	7.5	9.5	15.7	0.7	2.9	0.082	0.080	<.2
3/17/71	12:00PM	1.2	16	8.6	10.8	.45	32	.55	.83	
		0.44	11	9.6	11.6	<.1	8	0.22	0.27	7.2

LOCATION: OUT FALL TO DEAD CREEK

DESIGNATION: S-2

DATE	TIME	COPPER	COPPER pH2.5	ZINC	ZINC pH2.5	IRON	IRON pH2.5	CADMIUM	CADMIUM pH2.5	Lead pH
3/16/71	11:30AM	.2	.5	.2	21	<.1	<.1	<.02	.02	
		0.08	0.45	0.36	4.4	<.1	<.1	<.01	<.01	<.2
3/16/71	5:00PM	<.1	.15	.1	.6	<.1	<.1	<.02		
3/17/71	11:30AM	<.1	.75	.2	1.9	<.1	<.1	.02	.05	
		0.04	0.103	0.39	2.8	<.1	<.1	<.01	<.01	<.2

LOCATION: OUT FALL TO DEAD CREEK

DESIGNATION: S-4

DATE	TIME	COPPER	COPPER pH2.5	ZINC	ZINC pH2.5	IRON	IRON pH2.5	CADMIUM	CADMIUM pH2.5	Lead pH
3/16/71	11:30AM	<.1	.15	.15	2.4	.3	1.6	<.02	<.02	
		0.06	0.04	0.38	3.4	<.1	0.3	<.01	<.01	<.2
3/16/71	5:00PM	<.1	.5	.2	1.4	.75	2.35	.05	.02	
		0.06	0.20	0.18	3.3	<.1	0.45	<.01	<.01	<.2
3/17/71	11:30AM	.15	.15	.2	1.8	.45	2.7	.05	.02	
		<.03	<.03	0.4	2.7	<.1	0.4	<.01	<.01	<.2
3/17/71	6:00PM	<.1	.15	.5	3.3	.4	2.3	<.02	.02	
		0.10	0.07	0.56	3.8	<.1	0.6	<.01	<.01	<.2
3/17/71	12:00PM	.1	.25	.8	3.5	.3	2.9	<.02	<.02	
		0.04	0.11	0.95	3.1	<.1	1.8	0.010	0.010	<.2

Note: All values reported in mg/l.
* Normal stream pH

LOCATION: SLIMES

DESIGNATION: S-6 GRAB

DATE	TIME	COPPER *	COPPER pH2.5	ZINC	ZINC pH2.5	IRON	IRON pH2.5	CADMIUM	CADMIUM pH2.5	Lead	pH
3/16/71	10:15AM	54	54	15.5	16	-	-	1.48	1.5		
		44	44	100	100	3720	5900	0.59	0.40	—	—
3/16/71	5:00PM	-	-	16	15.5	-	-	1.0	1.02		
		354	56	46	53	1750	1750	0.025	0.25	7	
3/17/71	11:00AM	55	55	15	15.5	-	-	1.2	1.27		
		14	10.5	8.0	80	2450	2450	0.30	0.30	—	

LOCATION: POND

DESIGNATION: S-7

DATE	TIME	COPPER	COPPER pH2.5	ZINC	ZINC pH2.5	IRON	IRON pH2.5	CADMIUM	CADMIUM pH2.5	Lead	pH
3/16/71	10:05AM	.55	2.1	3.1	7.4	<.1	5.8	.02			
		0.17	1.75	2.6	6.0	<.1	1.9	<.01	0.010	<.2	3.
3/16/71	5:00PM	.1	.25	1.2	2.9	.3	7.7	<.02	.02		
		0.08	0.5	1.6	5.7	<.1	3.1	<.01	<.01	<.2	
3/17/71	12:20AM	<.1	.4	1.1	3.8	.65	5.8	<.02	.02		
		0.06	0.63	1.13	3.7	<.1	1.8	<.01	<.01	<.2	
3/17/71	11:00AM	.55	1.6	1.8	4.8	<.1	6.8	.02	.05		
		0.12	1.2	2.14	4.2	<.1	2	0.010	<.01	0.6	
3/17/71	6:00PM	1.3	7.6	8.2	10.4	.2	9.5	.09	.075		
		0.6	6.8	9.0	18	<.1	4	0.024	0.016	<.2	
3/17/71	12:00PM	<.1	.5	2.9	3.6	.2	4	<.02	.02		
		0.04	0.24	1.4	3.7	<.1	1	0.015	<.01	<.2	

Note: All values reported in mg/l.
* Normal stream pH

LOCATION: SLIMES

DESIGNATION: S-6

DATE	STA.	TIME	Fe(PPM)	Cu(PPM)	Zn(PPM)	Cd(PPM)	Pb(PPM)
3/23/71	S-6	10 AM	3,980	[illegible]	<.1	<.02	[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]	0.20	29
"	"	11 AM	5,000	44.0	28.0	0.9	
		[illegible]	[illegible]	[illegible]	[illegible]	0.28	41
"	"	12 PM	5,500	48.0	28.0	1.0	
		[illegible]	[illegible]	[illegible]	[illegible]	0.30	0.4
"	"	1 PM	5,750	45.0	28.5	0.2	
		[illegible]	[illegible]	[illegible]	[illegible]	0.33	3.2
"	"	2 PM	5,750	100.0	28.5	1.1	
		[illegible]	[illegible]	[illegible]	[illegible]	0.35	4.0
"	"	3 PM	5,600	2.9	28.0	1.1	
		[illegible]	[illegible]	[illegible]	[illegible]	0.34	4
"	"	4 PM	5,500	48.0	28.0	1.1	
		[illegible]	[illegible]	[illegible]	[illegible]	0.34	4
"	"	5 PM	5,750	36.0	28.7	1.1	
		[illegible]	[illegible]	[illegible]	[illegible]	0.35	3.8
"	"	6 PM	6,500	[illegible]	28.0	1.3	
		[illegible]	[illegible]	[illegible]	[illegible]	0.35	4.0
"	"	7 PM	6,400	100.0	28.5	1.3	
		[illegible]	[illegible]	[illegible]	[illegible]	0.35	4.0
"	"	8 PM	6,330	27.0	29.0	1.3	
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
"	"	9 PM	6,500	70.0	28.5	1.3	
		[illegible]	[illegible]	[illegible]	[illegible]	0.35	4.0
"	"	10 PM	5,950	70.0	28.5	1.3	
		[illegible]	[illegible]	[illegible]	[illegible]	0.36	4.0
"	"	11 PM	5,600	70.0	28.0	1.3	
		[illegible]	[illegible]	[illegible]	[illegible]	0.35	4.0
3/24/71	"	12 AM	5,950	[illegible]	28.5	1.3	
		[illegible]	[illegible]	[illegible]	[illegible]	0.35	4.0
"	"	1 AM	6,800	35.0	29.0	1.3	
		[illegible]	[illegible]	[illegible]	[illegible]	0.46	4.2
"	"	2 AM	7,000	70.0	29.0	1.8	
		[illegible]	[illegible]	[illegible]	[illegible]	0.53	4.2
"	"	3 AM	7,100	50.0	28.5	[illegible]	
		[illegible]	[illegible]	[illegible]	[illegible]	0.53	4.1

Note: All values reported in mg/l.

LOCATION: SCRUBBER #4 ANODE FURNACE
DESIGNATION: S-8

DATE	STA.	TIME	Fe (PPM)		Cu (PPM)		Zn (PPM)		Cd (PPM)		Lead (PPM)	
				pH 2.5		pH 2.5		pH 2.5		pH 2.5		pH 2.5
3/29/71	S-8	11 AM	<.1	0.45	0.7	1.1	0.75	2.5	<.02	<.02		
			0.2	0.3					<.02	<.02	6.2	0.4
"	"	12 PM	<.1	2.40	1.0	2.2	0.75	2.7	<.02	<.02		
			0.1	0.5					<.02	<.02	<.2	0.6
"	"	1 PM	<.1	1.00	1.35	2.4	0.4	2.1	<.02	<.02		
			0.1	0.2					<.02	<.02	<.2	0.7
"	"	2 PM	<.1	0.45	1.8	2.55	0.7	1.9	<.02	<.02		
			<.1	0.1					<.02	<.02	0.4	0.4
"	"	3 PM	0.20	0.25	.7	2.4	0.65	2.0	<.02	<.02		
			0.1	0.1					<.02	<.02	<.2	0.4
"	"	4 PM	<.1	0.25	1.65	32.0	19.2	21.4	0.5	0.5		
			<.1	<.1					0.24	0.20	0.4	0.6
"	"	5 PM	12.5	12.5	430.0	435.0	33.2	33.2	4.7	4.7		
			9.2	5.2					2.3	2.2	20	6.8
"	"	6 PM	2.10	4.50	70.0	78.0	31.2	31.2	3.7	3.7		
			0.6	0.9					1.8	1.8	7.1	5.9
"	"	7 PM	0.20	0.45	22.0	25.0	30.0	31.2	3.6	3.6		
			0.1	0.2					1.8	1.7	2.6	2.3
"	"	8 PM	4.00	6.20	52.0	20.2	32.2	32.7	4.7	4.7		
			1.1	1.2					2.3	2	8	3.6
"	"	9 PM	<.1	0.60	48.0	33.0	34.0	34.5	12.5	12.5		
			0.3	0.5					6	5.6	9	10
"	"	10 PM	<.1	1.70	165.0	180.0	35.0	35.0	13.9	13.9		
			0.1	0.6					6	5	14	4.2
"	"	11 PM	25.0	28.0	310.0	320.0	35.5	35.5	16.7	16.7		
			35	5.6					7	6	50	4.
3/30/71	"	12 AM	<.1	0.70	140.0	140.0	35.0	35.0	8.0	8.2		
			0.1	0.5					3.7	3.5	10	4.9
"	"	1 AM	<.1	0.25	0.7	1.8	15.4	19.2	1.1	1.2		
			0.1	<.1					0.5	0.45	0.6	0.8
"	"	2 AM	<.1	0.25	.35	2.35	2.2	3.6	1.6	1.7		
			0.1	0.1					0.84	0.65	1	1.
"	"	3 AM	<.1	0.35	2.65	6.5	10.4	14.0	3.4	3.6		
			0.1	0.1					1.8	1.4	1	3.

Note. All values reported in mg/l.

DESIGNATION: S-8 (continued)

DATE	STA.	TIME	Fe (PPM)	Fe (PPM) pH 2.5	Cu (PPM)	Cu (PPM) pH 2.5	Zn (PPM)	Zn (PPM) pH 2.5	Cd (PPM)	Cd (PPM) pH2.5	Pb (ppm)	Pb (ppm) ph2.5
3/30/71	S-8	4 AM	<.1	0.20	20.5	25.0	19.2	20.6	3.8	3.9		
			0.1	0.1					1.8	1.8	68	3
"	"	5 AM	0.20	0.20	31.5	40.5	20.0	20.0	3.0	3.0		
			0.1	0.2					1.0	1.5	7	2
"	"	6 AM	0.20	0.45	1.0	2.2	1.2	2.3	0.5	0.5		
			0.1	0.1					0.18	0.18	0.8	1.0
"	"	7 AM	0.25	1.00	8.55	9.5	5.2	7.95	0.9	0.9		
			0.2	0.1					0.38	0.37	2.2	0.6
"	"	8 AM	0.20	0.35	1.35	2.70	2.60	3.75	0.5	0.5		
			0.1	0.1					0.24	0.17		
"	"	9 AM	<.1	0.25	1.05	2.10	2.30	4.0	<.02	0.1		
			0.1	0.1					0.02	0.03	0.8	1
"	"	10 AM	<.1	0.20	1.0	1.85	2.3	5.0	<.02	<.02		
			0.1	<.1					<.02	<.02	0.6	1

Note: All values reported in mg/l.

LOCATION: SCRUBBER #3 ANODE FURNACE
DESIGNATION: S-9

DATE	STA.	TIME	Fe (PPM)		Cu (PPM)		Zn (PPM)		Cd (PPM)		Lead (PPM)	
				pH 2.5		pH 2.5		pH 2.5		pH 2.5		ph 2.5
3/23/71	S-9	10 AM	0.2	7.8	1.25	460	<.1	20.7	<.02	0.2		
			<.1	1.8					<.02	0.1	.04	.42
"	"	11 AM	<.1	9.3	1.25	450	0.2	20.7	<.02	0.2		
			<.1	1.9					<.02	0.08	.06	.28
"	"	12 PM	<.1	6.0	1.0	450	<.1	20.7	<.02	0.1		
			<.1	<.1					<.02	0.09	.04	.37
"	"	1 PM	<.1	10.0	0.7	210	.2	19.5	<.02	0.2		
			<.1	1.9					<.02	0.06	.04	.6
"	"	2 PM	<.1	8.3	<.1	476	<.1	25.0	<.02	0.2		
			<.1	1.5					<.02	0.06	<.2	.4
"	"	3 PM	<.1	4.5	1.0	238	0.6	25.0	<.02	0.2		
			<.1	2					<.02	0.06	<.2	.39
"	"	4 PM	<.1	5.7	0.5	180	0.9	27.0	0.2	0.3		
			<.1	2					<.02	0.08	<.2	.4
"	"	5 PM	<.1	9.0	0.5	180	0.6	22.7	<.02	0.2		
			<.1	1.7					<.02	0.08	<.2	.09
"	"	6 PM	<.1	11.0	<.1	27	<.1	28.0	0.1	0.1		
			<.1	1.7					<.02	0.03	<.2	.36
"	"	7 PM	<.1	15.0	0.4	282	<.2	27.8	1.3	0.4		
			<.1	1.9					0.08	0.1	<.2	.36
"	"	8 PM	<.1	9.3	0.55	135	28.5	20.7	0.1	0.2		
			<.1	1.7					0.04	0.07	<.2	.4
"	"	9 PM	0.1	39.5	1.55	200	28.0	2.3	1.5	1.7		
			3.5	5					0.67	0.7	0.4	.4
"	"	10 PM	<.1	17.0	17.5	140	28.5	28.5	7.2	7.2		
			<.1	1.6					3	3	10	4.2
"	"	11 PM	<.1	10.0	140	180	29.5	30.0	16.6	16.6		
			<.1	1.8					2.3	6.7	10	5.3
3/24/71	"	12 AM	2.0	36.3	416	460	30.0	30.0	17.1	17.2		
			1.9	4.4					7.8	6.7	40	.7
"	"	1 AM	7.1	28.0	300	225	29.0	29.5	15.5	15.5		
			6	3					6.7	6.2	35	5.4
"	"	2 AM	0.2	5.3	2.4	10.5	27.0	35.0	2.8	3.5		
			0.1	1					1.4	38	0.8	.4

Note: All values reported in mg/l

DESIGNATION: S-9 (continued)

DATE	STA.	TIME	Fe (PPM)		Cu (PPM)		Zn (PPM)		Cd (PPM)		[illegible] (PPM)	
				pH 2.5		pH 2.5		pH 2.5		pH 2.5		pH 2.5
3/24/71	S-9	3 AM	<.1	5.4	0.5	30.3	15.8	27.0	2.1	2.4		
			0.2	1.6					1	1	0.6	40
"	"	4 AM	0.2	6.0	0.6	25.0	1.8	25.0	1.5	1.8		
			0.2	1.1					0.64	0.70	0.6	4
"	"	5 AM	<.1	9.6	<.1	15.5	1.5	22.7	0.5	0.6		
			0.1	1.5					0.15	0.24	0.2	3
"	"	6 AM	<.1	10.0	0.7	20.3	2.2	24.2	0.4	0.9		
			<.1	2					0.15	0.24	0.3	3.8
"	"	7 AM	<.1	19.0	0.5	30.4	10.0	27.0	1.3	1.8		
			<.1	2.2					0.56	0.68	0.4	4
"	"	8 AM	0.2	7.5	0.6	42.5	3.7	26.0	0.6	1.2		
			<.1	1.4					0.28	0.46	0.3	4
"	"	9 AM	<.1	5.7	18.3	100	29.0	29.0	8.9	8.2		
			0.1	1.1					3.4	1.4	9	5

Note: All values reported in mg/l.

LOCATION: EAST SIDE OF JUNCTION
FROM [redacted] B-19

DESIGNATION: S-10

DATE	STA.	TIME	Fe (PPM)		Cu (PPM)		Zn (PPM)		Cd (PPM)		Lead (PPM)	
				pH 2.5		pH 2.5		pH 2.5		pH 2.5		ph 2.5
3/16/71	S-10	10:00 AM	<.1	<.1	.2	0.1	1.4	1.6	<.02	<.02		
			<.1	<.1	0.20	0.30	1.4	3.3	0.010	0.010	<.2	<.2
"	"	5:00 PM	<.1	3.7	.15	.75	.7	3.7	<.02	<.02		
			<.1	2.0	0.10	2.2	1.1	4	0.010	<.01	<.2	1.4
3/17/71	"	12:15 AM	.4	2.55	3	27	1.1	11.4	.02	.075		
			<.1	0.8	2.1	0.90	1.5	4.0	0.02	0.030	<.2	1.4
"	"	11:00 AM	<.1	.15	0.1	.9	.8	3.3	.05	.05		
			0.1	1.3	0.10	0.90	1.53	4.2	<.01	0.010	<.2	3
"	"	6:00 PM	15.2	15.3	14	14	4.2	10.2	.3	.25		
			21	23	14	13	175	20	0.11	0.090	3.4	3
"	"	12:00 AM	<.1	1.95	12.5	40	12.4	13	1.77	1.93		
			1.8	0.4	8.3	41	19.2	18.3	0.60	0.60	<.2	6

LOCATION: MANHOLE ON 18" LINE
FROM [redacted] B-19

DESIGNATION: S-11

DATE	STA.	TIME	Fe (PPM)		Cu (PPM)		Zn (PPM)		Cd (PPM)		Lead (PPM)	
				pH 2.5		pH 2.5		pH 2.5		pH 2.5		ph 2.5
3/16/71	S-11	10:00 AM	<.1	1	1.05	180	.3	4.0	<.02	.05		
			<.1	0.22	0.63	107	0.16	4.8	<.01	0.026	<.2	1.8
	"	5:00 PM	<.1	<.1	.6	5	.1	1.6	.02	<.02		
			<.1	<.1	0.24	6.2	<.1	2.8	<.01	<.01	<.2	<.
3/17/71	"	12:15 AM	<.1	.2	4	36	.8	3.6	.05	.12		
			<.1	<.1	0.4	37	1.2	3.1	0.03	0.05	<.2	18
"	"	11:00 AM	<.1	.45	1.75	<.1	.2	3.4	<.02	.05		
			<.1	<.1	0.74	14.6	0.2	3.4	<.01	0.05	0.2	1.8
"	"	6:00 PM	<.1	.4	1.1	14.5	.2	2.3	<.02	.02		
			<.1	0.1	0.50	14	1.39	3.3	<.01	<.01	<.2	0.3
"	"	12:00 PM	<.1	<.1	5	42	.5	<.1	<.02	<.02		
			<.1	<.1	1.6	50	0.6	2.3	0.08	—	—	—

Note: All values reported in mg/l.

LOCATION: SCRUBBER - [redacted] FURNACE

MAERZ

DESIGNATION: S-12

DATE	STA.	TIME	Fe (PPM)		Cu (PPM)		Zn (PPM)		Cd (PPM)		Lead (PPM)	
				pH 2.5		pH 2.5		pH 2.5		pH 2.5		pH 2.5
3/15/71	S-12	3:00 PM	<.1	<.1	.5	3.2	.1	1.0	<.02	<.02		
			<.1	<.1	0.1	3	0.14	3	<.01	<.01	6.2	6.
"	"	4:00 PM	<.1	<.1		2.2	1	7	<.02	<.02		
			<.1	<.1	0.1	1.8	0.44	4.5	<.01	<.01	<.2	<.2
"	"	5:00 PM	<.1	<.1	1.5	1.0	.1	.2	.05	.02		
			<.1	<.1	0.12	9.0	0.14	1.8	<.01	<.01	<.2	1.4
"	"	6:00 PM	<.1	.15	1.0	10	.1	1.2	<.02	.02		
			<.1	<.1	0.2	11.3	0.1	3	<.01	<.01	<.2	<.3
"	"	7:00 PM	<.1	.4	1.0	34	.2	2.2	.05	.075		
			<.1	0.1	0.52	81	0.45	3.45	0.010	0.025	<.2	2.5
"	"	8:00 PM	<.1	.3	205	215	3.5	3.9	.2	.12		
			<.1	0.1	194	161	4	4.9	0.054	0.040	4	3.5
3/16/71	"	9:00 AM	<.1	.3	7	110	.3	5	.05	.05		
			<.1	<.1	0.51	94	0.1	4.2	<.01	0.030	<.2	2.
"	"	10:00 AM	<.1	.15	9	140	4	5.2	.05	.05		
			<.1	0.1	0.78	125	<.2	6.8	<.01	0.025	0.14	2
"	"	11:00 AM	<.1	.1	12	153	9	7.6	<.02	.075		
			<.1	<.1	0.80	122	0.14	6.8	<.01	0.025	<.2	2
"	"	12:00 AM	<.1	.3	46	90	.9	5.5	.075	.02		
			<.1	<.1	0.8	81	0.16	5.3	<.01	0.015	<.2	2.
"	"	1:00 PM	<.1	<.1	12	42	.6	2.5	<.02	<.02		
			<.1	<.1	0.5	37	0.39	3.25	<.01	0.015	<.2	2
"	"	2:00 PM	<.1	<.1	5	18	.3	1.5	.02	.02		
			<.1	<.1	0.6	16.6	0.3	3	<.01	<.01	<.2	0.6
"	"	3:00 PM	<.1	<.1	8	10	.2	1.2	<.02	<.02		
			<.1	<1	0.51	7.9	0.20	2.14	<.01	0.020	<.2	0.
3/17/71	"	12:00 AM	<.1	1	10	303	10.1	10.7	1.00	1.12		
			0.1	0.3	240	240	14.1	12.5	0.42	0.42	6	3.8
"	"	1:00 AM	<.1	.3	340	<.1	10.7	11.3	1.65	1.62		
			<.1	.15	340	260	17.5	14	0.68	.050	20	4

Note: All values reported in mg/l.

DESIGNATION: S-12 (continued)

DATE	STA.	TIME	Fe (PPM)		Cu (PPM)		Zn (PPM)		Cd (PPM)		Lead (PPM)	
				pH 2.5		pH 2.5		pH 2.5		pH 2.5		ph2.5
3/17/71	S-12	2:00 AM	<.1	.6	40	8	11.8	11.5	1.80	1.80		
			0.1	0.2	3.8	2.75	18.3	12.5	0.70	0.58	20	4
"	"	3:00 AM	<.1	.45	680	700	11.8	12.1	1.6	1.68		
			<.1	0.2	5.1	460	12	14	0.58	0.48	—	17
"	"	4:00 AM	<.1	.65	50	730	10.1	10.2	1.72	1.72		
			<.1	0.1	5.0	490	9.3	10	0.54	—	16	—
"	"	5:00 AM	<.1	<.1	13	220	8.7	8.2	1.57	1.5		
			<.1	<.1	1.85	177	8.7	6.8	0.60	0.50	6.8	4
"	"	6:00 AM	<.1	<.1	45	44	5.3	6.3	1.0	1.08		
			<.1	<.1	3.2	40	5.7	5.8	0.40	0.38	<.2	1.6
"	"	7:00 AM	<.1	<.1	4.5	79	1.5	3.2	.45	.5		
			<.1	<.1	1.95	57	1.9	3.9	0.156	0.156	<2	—
"	"	8:00 AM	<.1	<.1	4	55	.5	2.3	.2	.21		
			<.1	<.1	0.8	50	1	3.1	0.06	0.075	—	2
"	"	9:00 AM	<.1	.3	3	179	.5	5.3	.05	<.02		
			<.1	0.14	1.80	90	0.4	5.2	0.020	0.040	0.6	2.5
"	"	10:00 AM	<.1	<.1	4.5	125	.3	4.7	<.02	.02		
			<.1	0.1	1.1	?	0.26	4.6	0.015	—	—	1.0

LOCATION: OUTFALL TO DEAD CREEK

DESIGNATION: S-13A

DATE	STA.	TIME	Fe (PPM)		Cu (PPM)		Zn (PPM)		Cd (PPM)		Lead (PPM)	
				pH 2.5		pH 2.5		pH 2.5		pH 2.5		ph2.5
3/16/71	S-13A	11:30 AM	2.1	3.9	.2	.5	.4	1.7	<.02	<.02		
			<.1	1.8	0.6	0.6	.7	4.3	<.01	<.01	<.2	<.5
"	"	11:00 AM	1.5	47	.2	.65	.2	.9	<.02	<.02		
			<.1	1.1	0.20	0.70	0.4	3.1	<.01	<.01	<.2	<.5

Note: All values reported in mg/l.

LOCATION: POND AREA

DATE	STA.	TIME	Fe (PPM)	Fe (PPM) pH 2.5	Cu (PPM)	Cu (PPM) pH 2.5	Zn (PPM)	Zn (PPM) pH 2.5	Cd (PPM)	Cd (PPM) pH 2.5
4/1	P-1		1.0	1.5	<.1	0.25	0.10	0.30	<.02	<.02
4/1	P-2		1.0	1.7	<.1	0.40	0.10	0.40	<.02	<.02
4/1	P-3		<.1	<.1	<.1	0.15	0.05	0.20	<.02	<.02
4/1	P-4		0.25	0.25	0.25	0.45	0.25	2.30	<.02	<.02
4/1	P-5		<.1	<.1	0.45	1.20	0.25	0.90	<.02	<.02
4/4	P-6		<.1	6.1	.4	6.4	1.6	3.7	<.02	.02

Note: All values reported in mg/l.

APPENDIX III

DATA SUMMARY

DATA - SUMMARY

Location: West End of Control Center

Designation: S-1

Element	Range	Average	Number of Observations
Cu *	<.1 - 1.85	.96	4
Cu (2.5)	<.03 - 1.5	.54	4
pH	2.25 - 10	6	4
Zn	1.3 - 11	5.35	4
Zn (2.5)	1.5 - 8.7	5.3	4
Fe	4.96 - 9.5	6.09	4
Fe (2.5)	5.3 - 10.8	8.4	4
Cd	4.2 - 15.7	9.08	4
Cd (2.5)	.3 - .45	.39	4
Pb	<.1 - 0.2	0.09	4
Pb (2.5)	10.4 - 32	13.	4
	2.9 - 8	4.45	4
	<.02 - .55	.21	4
	0.082 - 0.22	0081	4
	<.02 - .83	.29	4
	0.080 - 0.27	0.093	4
	<.2 - <.2	<.2	4
	1.8 - 4.5	3.6	4

Location: Outfall to Dead Creek

Designation: S-2

Element	Range	Average	Number of Observations
Cu	<.1 - .2	.13	3
Cu (2.5)	0.05 - 0.09	0.07	3
Zn	.5 - .75	.67	3
Zn (2.5)	0.10 - 0.30	0.18	3
Fe	.1 - .2	.17	3
Fe (2.5)	0.2 - 0.39	0.32	3
Cd	.6 - 21	7.8	3
Cd (2.5)	2.4 - 4.4	3.2	3
Pb	<.1 - <.1	<.1	3
Pb (2.5)	<.1 - <.1	<.1	3
	<.1 - 0.1	<.1	3
	<.02 - .02	.02	3
	<.01 - <.01	<.01	3
	<.02 - .05	.03	3
	<.01 - <.01	<.01	3
	<.2 - <.2	<.2	3
	<.2 - <.2	<.2	3

Note: All values reported in mg/l.

* Normal stream pH

Location: Outfall to Dead Creek

Designation: S-4

Element	Range	Average	Number of Observations
Cu	<.1 - .15	<.1	5
Cu (2.5)	.15 - .5	.24	5
Zn	.15 - .8	.37	5
Zn (2.5)	1.4 - 3.5	2.3	5
Fe	.3 - .75	.44	5
Fe (2.5)	1.6 - 2.9	2.5	5
Cd	<.02 - .05	<.02	5
Cd (2.5)	<.02 - .02	.02	5
Pb	<.2 - <.2	<.2	5
Pb (2.5)	<.2 - <.2	<.2	5

Location: Slimes(Grab Samples)

Designation: S-6

Element	Range	Average	Number of Observations
Cu	54 - 55	54	2
Cu (2.5)	54 - 55	54	2
Zn	15.5 - 16	16	3
Zn (2.5)	15.5 - 16	16	3
Fe	1750 - 3900	2700	3
Fe (2.5)	1750 - 3900	2700	3
Cd	1.0 - 1.48	1.2	3
Cd (2.5)	1.02 - 1.5	1.3	3
Pb	57	57	1
Pb (2.5)	6	6	1

Location: Pond

Designation: S-7

Element	Range	Average	Number of Observations
Cu	.1 - 1.3	.45	6
Cu (2.5)	.25 - 2.6	2.1	6
Zn	1.1 - 8.2	3.0	6
Zn (2.5)	2.9 - 10.1	5.4	6
Fe	<.1 - .65	.26	6
Fe (2.5)	4 - 9.5	6.6	6
Cd	<.02 - .09	.04	6
Cd (2.5)	<.02 - .08	.04	5
Pb	<.01 - 0.065	0.018	6
Pb (2.5)	0.2 - 0.6	0.26	6
	0.4 - 4	2.3	6

Location: Slimes

Designation: S-6

Element	Range	Average	Number of Observations
Fe	3,980 - 7,100	5,930	18
Cu	[illegible]	[illegible]	[illegible]
Zn	<.1 - 29	28	18
Cd	<.1 - 1.8	1.1	18
	0.28 - 0.53	0.36	18
Pb	0.4 - 4.2	3.8	18

Location: Scrubber #4 Anode Furnace

Designation: S-8

Element	Range	Average	Number of Observations
Cu	7 - 430	55	24
Cu (2.5)	1.1 - 435	57	24
Zn	1.2 - 35.5	15	24
Zn (2.5)	1.9 - 35.5	17	24
Fe	<.1 - 25	1.2	24
Fe (2.5)	<.1 - 35	2.01	24
Cd	.20 - 28	2.6	24
Cd (2.5)	<.1 - 5.6	0.71	24
	<.02 - 16.7	3.5	24
	<.02 - 3.7	1.61	24
	<.02 - 16.7	3.5	24
	<.02 - 5.6	1.49	24
Pb	<.2 - 20	6.25	24
Pb (2.5)	0.4 - 10	2.45	24

Location: Scrubber #3 Anode Furnace

Designation: S-9

Element	Range	Average	Number of Observations
Cu	<.1 - 410	38	24
Cu (2.5)	10.5 - 460	50	24
Zn	<.1 - 50	12	24
Zn (2.5)	<.1 - 30	23	24
Fe	<.1 - 7.1	49	24
Fe (2.5)	<.1 - 6	0.63	24
Cd	4.5 - 39	12	24
Cd (2.5)	<.1 - 5	1.50	24
	<.02 - 17.1	3.2	24
	<.02 - 7.8	1.45	24
	<.02 - 17.2	3.9	24
	<.02 - 6.7	0.83	24
Pb	<.2 - 40	3.31	24
Pb (2.5)	3.7 - 7	4.32	24

Location: East Side of Junction from Shaft Furnace

Designation: S-10

Element	Range	Average	Number of Observations
Cu	<.1 - 12.5	2.7	6
Cu (2.5)	1 - 40	14	6
Zn	.7 - 12.4	3.4	6
Zn (2.5)	1.6 - 13	6.0	6
Fe	.1 - 15.3	3.7	6
Fe (2.5)	.1 - 15.3	4.5	6
Cd	<.02 - 1.77	.39	6
Cd (2.5)	.05 - 1.93	.42	6
Pb	<.2 - 3.4	1.2	6
Pb (2.5)	<.2 - 1.6	2.08	6

Location: Manhole on 10" Line from Shaft Furnace Building

Designation: S-11

Element	Range	Average	Number of Observations
Cu	.6 - 5.0	2.2	6
Cu (2.5)	5 - 180	52	5
Zn	.1 - .8	.4	6
Zn (2.5)	1.6 - 3.6	3.0	5
Fe	<.1	<.1	6
Fe (2.5)	<.1 - 1.0	.43	5
Cd	<.02 - .05	<.02	6
Cd (2.5)	<.02 - .12	.05	6
Pb	<.2 - <.2	<.2	5
Pb (2.5)	<.2 - 1.8	0.98	5

DATA - SUMMARY (continued)

Location: Scrubber - Shaft Furnace
Designation: S-12

Element	Range	Average	Number of Observations
Cu	.5 - 680	101	24
Cu (2.5)	1.0 - 700	142	23
Zn	.1 - 11.8	3.3	24
Zn (2.5)	.2 - 12.1	5.2	24
Fe	<.1	<.1	24
Fe (2.5)	<.1 - 1.0	<.1	24
Cd	<.02 - 1.80	.49	24
Cd (2.5)	<.02 - 1.80	.49	24

Monsanto Enviro-Chem Systems Inc.
10 SOUTH RIVERSIDE PLAZA / CHICAGO, ILLINOIS 60606 / (312) 782-0372

October 23, 1972

Cerro Copper and Brass Company,
St. Louis Works
Post Office Box 681
East St. Louis, Illinois 62202

Attention: Mr. W. Lorenz

Dear Bill:

Enclosed is my proposed schedule for a sampling and testing program as we discussed during my site visit on Tuesday, October 17. The results from this testing regime will enable Enviro-Chem to more fully determine water reuse potential and evaluate means of affecting in-plant water use reductions.

The duration of this special sampling and testing program should be seven working days. The attachment identifies what sample is to be collected, how it is to be collected, and what tests are required. If the program presents any problems for you and your people, or if you have any questions concerning this program, please feel free to contact me.

Very truly yours,

Reginald Scott

Reginald Scott
Process Engineer

RS/smh
enclosure
bcc: J. Goldenberg) Cerro
W. Graff)
J. L. Jones

G311-2

SAMPLING AND TESTING PROGRAM - CERRO COPPER AND BRASS - OCTOBER 1972

Unit or Area	Sample	Analyses Required[1]	Frequency
Maertz Furnace (#6 Billet)	1) Water to settling tank	SS,TS,DS,pH,Cl^-, metals, alkalinity, acidity, oil & grease	24 hourly composite
	2) Water to sewer		1 x daily
	3) Water to settling tank	settling test[2]	3 x daily
	4) Water to settling tank	pH	24 x daily[3]
#3 and/or #4 Anode Furnace	1) Water to settling tank	SS,TS,DS,pH,Cl^-, metals, alkalinity, acidity, oil & grease	24 hourly composite
	2) Water to pond		1 x daily
	3) Water to settling tank	settling test[2]	3 x daily
	4) Water to settling tank	pH	24 x daily[3]
Pond	1) Discharge to sewer	SS,TS,DS,pH,Cl^-, metals, alkalinity, acidity, oil & grease	24 hourly composite, 1 x daily
Tube Mill	1) Discharge to Dead Creek	SS,TS,DS,pH,Cl^-, metals, alkalinity, acidity, oil & grease	24 hourly composite, 1 x daily
North Area	1) Discharge to Dead Creek	SS,TS,DS,pH,Cl^-, metals, alkalinity, acidity, oil & grease	24 hourly composite, 1 x daily

Unit or Area	Sample	Analyses Required[1]	Frequency
Bosh Tank	1) Discharge to Pond	SS,TS,DS,pH,Cl^-, metals, alkalinity, acidity, oil & grease	24 hourly composite 1 x daily

Notes: (1) SS = Suspended Solids, mg/l
TS = Total solids, mg/l
DS = Dissolved solids, mg/l
Cl^- = Chloride, mg/l
Metals = Fe, Cd, Zn, Cu
Alkalinity = phenolphthalein and point, mg/l $CaCO_3$
Acidity = methyl-orange and point, mg/l $CaCO_3$
Oil & Grease = hexane solubles

All tests can be found in "Standard Methods", 13th ed.

(2) Settling test = interface level vs. time in a standard 1 liter graduated cylinder.

(3) Test can be performed on 24 1 hour samples from sampler before samples are composited into daily composite.

WASTE WATER TEMPERATURES

		10:00 AM	2:00 PM	4:00 PM	8:00 PM
MAY 8	ADMINISTRATION BLDG	74°F	75°	76°	74°
"	DEAD CREEK	68°	69°	70°	70°
MAY 9	ADMINISTRATION BLDG	78°F	82°	81°	72°
"	DEAD CREEK	72°	78°	70°	72°

OPERATIONS

SHAFT	1 DRUM
MACHE	✓
#5 DC	✓
#3 ANODE	HOLDING
#4 ANODE	DOWN

SHAFT	DOWN
MACHE	✓
#5 DC	✓
#3 ANODE	✓
#4 ANODE	DOWN

WELL WATER 59°F

CITY WATER 63°F

Memo

ENGINEERING DEPT.

C311-3

TO: Paul Tandler DATE 5/10/72

SUBJECT: WASTE WATER TEMPERATURES

ATTACHED IS A RECORD OF THE WASTE WATER TEMPERATURES TAKEN AT 4 TIMES ON MAY 8 & 9. THE DIFFERENCES, MOST NOTICABLE AT THE ADMINISTRATION BLOG, REFLECTS THE FACT THAT THE #3 ANODE DID NOT RUN ON MAY 8 BUT DID POUR ON MAY 9

COPIES TO: BILL GRAFF

Cerro Copper & Brass
St Louis Works

Dec. 1, 1971

C311-4

Sewer Survey

	City Water		Deepwell Water	
	Present	Proposed	Present	Proposed
Mears Poll. System	85	40	—	—
Bldg. 19 Tower	80	80 max.	—	—
Anode #3 A.P. System	—	—	100 est.	50
Anode #4 A.P. System	—	—	75 est.	50
Anode Furn. Tower	—	—	—	—
No. 5 D.C. Tower	—	—	—	—
New #5 BAF Tower	—	25 est.	—	—
BAF #2 Heat Exchang.	—	—	250 est.	250 max. (Infrequent use)
BAF #3 " "	—	—	180 est.	180 max.
BAF #5 " "	100	—	200 est.	200 max.
Ext. Press #3 - Pits	100	25	—	—
Anode Bosh Tanks	—	—	300 est	—
Foundry Compressors	—	—	30	—
Bldg. 80 "	—	—	25	—
Iron Tanks - Slimes	15	15	—	—
GPM →	380	185	1160	730

Present flow 1540 GPM (Biodize - 6/23/71 - 1525 GPM)
Proposed " 915 "

Proposed reduction in flow to sewers 40% (conservatively)

Further reductions are being studied - these involve mechanical refrigeration in lieu of well water for annealing furnace heat exchangers.

FLOW TO SEWER.

	City Water		Well Water		Pond	
	Present	Future	Present	Future	Present	Future
Mader Poll. System	85	40	0	0		
Bldg 19 Tower	80	80 Should be less	0	0		
Anode 3 Poll System			100 est	50		
Anode 4 Poll System			75 est	50		
Anode Tower	0	0	0	0		
#5 DC Tower	0	0	0	0		
New #5 BAF Tower	0	25 est	0	0		
BAF #2			250 est	Less than 250		
BAF #3			180 est	Less than 180		
BAF #5	100	0	200 est	Less than 200		
Basement #3 Ext Press	100	25	0	0		
Bosch Tanks	0	0	300/600 est	0	0	300/600
Foundry Compressors	0	0	30	0		
Bldg 80 Compressors	0	0	25	0		
Iron Tanks	14	14				
	380 GPM	180 GPM	1160/1460 GPM	Less than 930 GPM		300/600 GPM
	Present	1540/1840 GPM				
	Future	930 GPM				

1. Flow in line from Bldg 19 should consist of normal sanitary water from Mat'l Receiving Bldg and Bldg 19 plus bleed from Maerz pollution system which should be about 25-30 GPM. Bldg 19 cooling tower should have a bleed off added.
2. The Pollution Control System for the #3 Anode is using an excess of well water which should be reduced. The well water or city water make-up should be on a float or probe set up and bleed off should be controlled.
3. The pollution control system for the #4 anode is using well water for make up, not float controlled, but manually regulated to overflow steadily. This well water line should be float controlled. The city water is probe controlled and set to be opened only when well water make-up is insufficient.
4. Tower water, Anode Bldg, is city water make-up with float controls
5. Tower water, #5 DC, is city water make-up with probe controls.

6. Cooling tower for #5 BAF is using an excessive amount of city water. This tower is being replaced by the larger tower formerly used on the Anode #3 furnace.

7. Cooling towers for the Joy compressor in the Ext Press area and the one for the compressors in the Extrusion Bay are city water make-up on float controls

8. Cooling Tower for the Joy compressor in Bldg 19 is city water make-up on float controls

9. The Foundry compressors and the Bldg 80 compressors are handled by heat exchangers using well water for cooling. The Bldg 80 system is being added to the new tower installation for the Degreaser. The Foundry system should be connected to a tower or refrigerated system.

10. BAF #2 has 2 well water to city water heat exchangers 1-1¼ line and 1-2" line.

11. BAF #3 has 2 well water atmosphere coolers, 1-2" line for both.

12. BAF #5 has 1 well water atmosphere cooler, 1-1½ line.

THROUGH THE INSTALLATION OF THE SETTLING TANK TO HANDLE THE CONTAMINATED WATER FROM THE ANODE POLLUTION SYSTEMS, THE POND WILL REMAIN RELATIVELY CLEAN AND SHOULD BE SUITABLE FOR BOSCH TANK COOLING WATER. DURING HOT WEATHER A NUMBER OF SPRAY NOZZLES CAN BE ADDED FOR POND COOLING. THE SOLIDS COLLECTED IN THE SETTLING TANKS SHOULD REDUCE THE CONTAMINATES TO WELL BELOW THE STANDARDS.

FLOW MEASUREMENTS AS REPORTED BY BIODISE 6/23/71

MAERE	S-12	83.5 GPM	16.18 #/DAY OF Cu.
POND	S-7	275 GPM	12.7 #/DAY OF Cu
#3 ANODE	S-9	25 GPM	44.2 #/DAY OF Cu
TUBE MILL	S-4	380 GPM	
NORTH ADIT	S-5	345 GPM	
SLIMES	S-6	13.9 GPM	5.13 #/DAY OF Cu
DEAD CREEK		1150 GPM	43.17 #/DAY Cu
ADMINISTRATION BLDG		375 GPM	53.9 #/DAY Cu

COMPARISON

	Cerro	Bodie
North Area		5-5 345
#3 BAF	180	
#3 Ent Area	100	
#5 BAF	300	
Tube Mill		5-4 380
Iron Tanks		5-6 14
Anode 3	100	25
Incinerator	50	
	730	764
Dead Creek		1150
Mker 2	85	83
Pond	300/600	275
Bldg 19	80	
Bldg 80 Comp	20	
	485/785	358
Administration		375

Cerro Copper & Brass
St Louis Works

Dec. 1, 1971

C311-5

Sewer Survey

	City Water		Deepwell Water	
	Present	Proposed	Present	Proposed
Mears Poll. System	85	40	–	–
Bldg. 19 Tower	80	80 max.	–	–
Anode #3 A.P. System	–	–	100 est.	50
Anode #4 A.P. System	–	–	75 est	50
Anode Furn. Tower	–	–	–	–
No. 5 D.C. Tower	–	–	–	–
New #5 BAF Tower	–	25 est.	–	–
BAF #2 Heat Exchang.	–	–	250 est.	250 max. (Effluent use)
BAF #3 " "	–	–	180 est.	180 max.
BAF #5 " "	100	–	300 est.	200 max.
Rich Process Pits	100	25	–	–
Anode Scale Tanks	–	–	300 est	–
Foundry Compressors	–	–	30	–
Bldg. 30 "	–	–	35	–
Iron Tanks - Slimer	15	15	–	–
GPM →	380	185	1160	730

Present flow 1540 GPM (Discharge - Sept. = 1035 GPM)
Proposed " 925 "

Proposed reduction in flow to sewers 40% (conservatively)

Further reductions are being studied - base, inside mechanical refrigeration flow in lieu of well water for annealing furnace heat exchangers.

FLOW TO SEWER.

	City Water		Well Water		Pond	
	Present	Future	Present	Future	Present	Future
Magee Poll System	85	40	0	0		
Bldg 19 Tower	30	30 Should be less	0	0		
Anode 3 Poll System			100 est	50		
Anode 4 Poll System			75 est	50		
Anode Tower	0	0	0	0		
#5 DC Tower	0	0	0	0		
New #5 BAF Tower	0	25 est	0	0		
BAF #2			250 est	Less than 250		
BAF #3			130 est	Less than 130		
BAF #5	100	0	200 est	Less than 200		
Basement #3 Gas Pipers	100	25	0	0		
Bosch Tanks	0	0	300/600 est	0	0	300/600
Foundry Compressors	0	0	30	0		
Bldg 50 Compressors	0	0	25	0		
Iron Tanks	14	14				
	320 GPM	180 GPM	1160/1460 GPM	Less than 730 GPM		300/600 GPM
	Present	1430/1730 GPM				
	Future	930 GPM				

FLOW TO SEWER.

	City Water		Well Water		Pond	
	Present	Future	Present	Future	Present	Future
Maerz Poll. System	85	40	0	0		
Bldg 19 Tower	80	80 Should Be Less	0	0		
Anode 3 Poll System			100 Est	50		
Anode 4 Poll System			75 Est	50		
Anode Tower	25 Est	25	0	0		
#5 DC Tower	20	20	0	0		
New #5 BAF Tower	0	25 Est	0	0		
BAF #2			250 Est	Less Than 250		
BAF #3			180 Est	Less Than 180		
BAF #5	100	0	200 Est	Less Than 200		
Basement #3 Ext Press	100	25	0	0		
Bosch Tanks	0	0	600 Est	0	0	600
Foundry Compressors	0	0	30	0		
Bldg 80 Compressors	0	0	25	0		
	410 GPM	215 GPM	1460 GPM	Less Than 80 GPM		

697

1870 GPM
945 GPM

1. FLOW IN LINE FROM BLDG 19 SHOULD CONSIST OF NORMAL SANITARY WATER FROM MAT'L RECEIVING BLDG AND BLDG 19 PLUS BLEED FROM MAERZ POLLUTION SYSTEM WHICH SHOULD BE ABOUT 25-30 GPH. BLDG 19 COOLING TOWER SHOULD HAVE A BLEED OFF ADDED.
2. THE POLLUTION CONTROL SYSTEM FOR THE #3 ANODE IS USING AN EXCESS OF WELL WATER WHICH SHOULD BE REDUCED. THE WELL WATER OR CITY WATER MAKE-UP SHOULD BE ON A FLOAT OR PROBE SET UP AND BLEED OFF SHOULD BE CONTROLLED.
3. THE POLLUTION CONTROL SYSTEM FOR THE #4 ANODE IS USING WELL WATER FOR MAKE UP, NOT FLOAT CONTROLLED, BUT MANUALLY REGULATED TO OVERFLOW STEADILY. THIS WELL WATER LINE SHOULD BE FLOAT CONTROLLED. THE CITY WATER IS PROBE CONTROLLED AND SET TO BE OPENED ONLY WHEN WELL WATER MAKE-UP IS INSUFFICIENT.
4. TOWER WATER, ANODE BLDG, IS CITY WATER MAKE-UP WITH FLOAT CONTROLS
5. TOWER WATER, #5 DC, IS CITY WATER MAKE-UP WITH PROBE CONTROLS.

6. Cooling tower for #5 BAF is using an excessive amount of city water. This tower is being replaced by the larger tower formerly used on the Anode #3 furnace.

7. Cooling towers for the Joy compressor in the Ext Press area and the one for the compressors in the Extrusion Bay are city water make-up on float controls

8. Cooling Tower for the Joy Compressor in Bldg 19 is city water make-up on float controls

9. The Foundry compressors and the Bldg 80 compressors are handled by heat exchangers using well water for cooling. The Bldg 80 system is being added to the new tower installation for the Degreaser. The Foundry system should be changed to a tower or refrigerated system.

10. BAF #2 has 2 well water to city water heat exchangers 1-1¼ Line and 1-2" Line.

11. BAF #3 has 2 well water atmosphere coolers, 1-2" line for both.

12. BAF #5 has 1 well water atmosphere cooler, 1-1½ line.

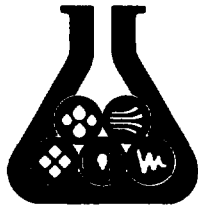
Results of account check by Brookings

3/7/72

DEAD CREEK	24 HR AVE	972 GPM	1.4 MG/D
	3 HR MAX	1105 GPM	
	1 HR MIN	775 GPM	
ADMISISTRATION BLDG	24 HR AVE	442 GPM	.642 MG/D
	12 HR MIN	260 GPM	
	6 HR MAX	934 GPM	

Consulting environmental engineers

12161 Lackland Road
St. Louis, Missouri 63141
(314) 434-6960



Ryckman/Edgerley/Tomlinson & Associates, Inc.

Offices:

McLean, Virginia (Washington, D.C.)

Dayton, Ohio

Memphis, Tennessee

Bryan, Texas

Casper, Wyoming

Chicago, Illinois

Northumberland, England

Rome, Italy

January 10, 1972
RETA-1445-D

Mr. William P. Lorenz
Laboratory Director
Cerro Copper Products Division
St. Louis Works
Post Office Box 681
East St. Louis, Illinois 62202

Dear Mr. Lorenz:

It was a pleasure to have you and Mr. W. G. Graff visit Ryckman, Edgerley, Tomlinson & Associates' (RETA) St. Louis headquarters last week. Ray Hulse and I certainly enjoyed the opportunity to discuss wastewater treatment and analysis problems with you.

As we discussed, RETA is genuinely interested in serving Cerro Corporation in any environmental engineering related activity. Please feel free to call upon us at any time should you desire to discuss a specific problem.

Very truly yours,

C D Bulla

C. D. Bulla, III
Senior Associate

CDB/scn

CC: Mr. J. W. Goldenberg - Cerro
Mr. W. G. Graff - Cerro
Dr. H. D. Tomlinson - RETA

C311-7

Hg.
PPM

A — 0.122
B 0.160
C. 0.092
D 0.098
E 0.0015
G 0.0003
H - less .00025
J "
K .0007
L .014
M .012

Lena Burger

C311-8

PANOCO

POLLUTION CONTROL
SAMPLING EQUIPMENT

Paul Noascono Company

PHONE: 618-344-3706

805 ILLINOIS AVENUE • COLLINSVILLE, ILLINOIS 62234

Gentlemen:

The enclosed brochure shows our automatic sewer sampler which has been fully tested for several years by many chemical companies, as well as government agencies.

The sampler was designed mainly for chemical plants where the enviroment is corrosive. The materials are corrosion proof. At the same time the moving parts have been designed for a continuous work under severe conditions.

The sampler can be winterized by using electric heating elements, such as mats, tapes, flood lamps, etc. The box is provided with enough electric outlets for this service.

We are in a position to ship 6 samplers within 3 weeks notice.

The price of the complete unit is $320.-F.O.B. Collinsville, Illinois. We can furnish the pump unit only, at $150. each.

Yours very truly,
The Paul Noascono Company

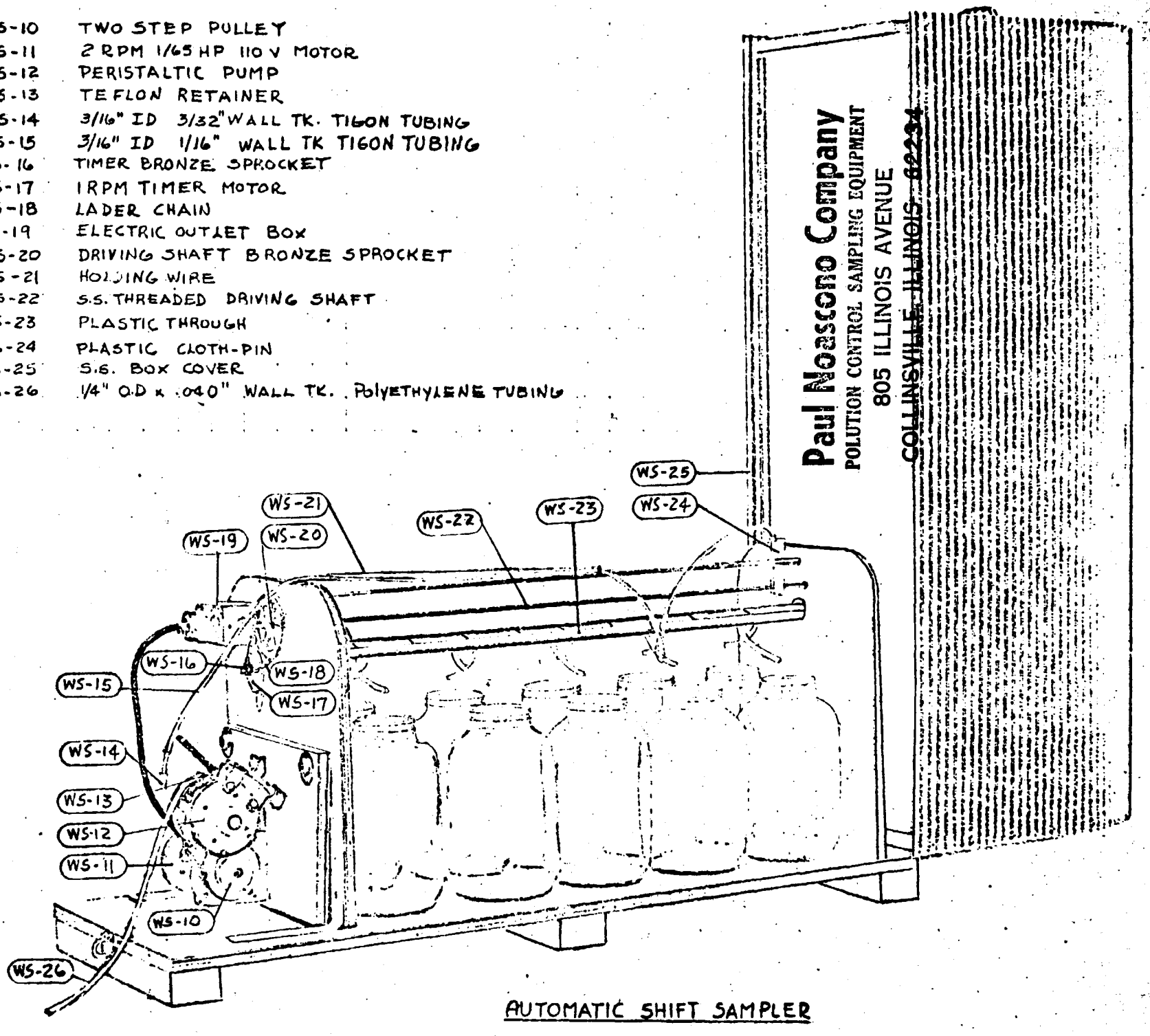
Paul Noascono

Paul Noascono

C311-9

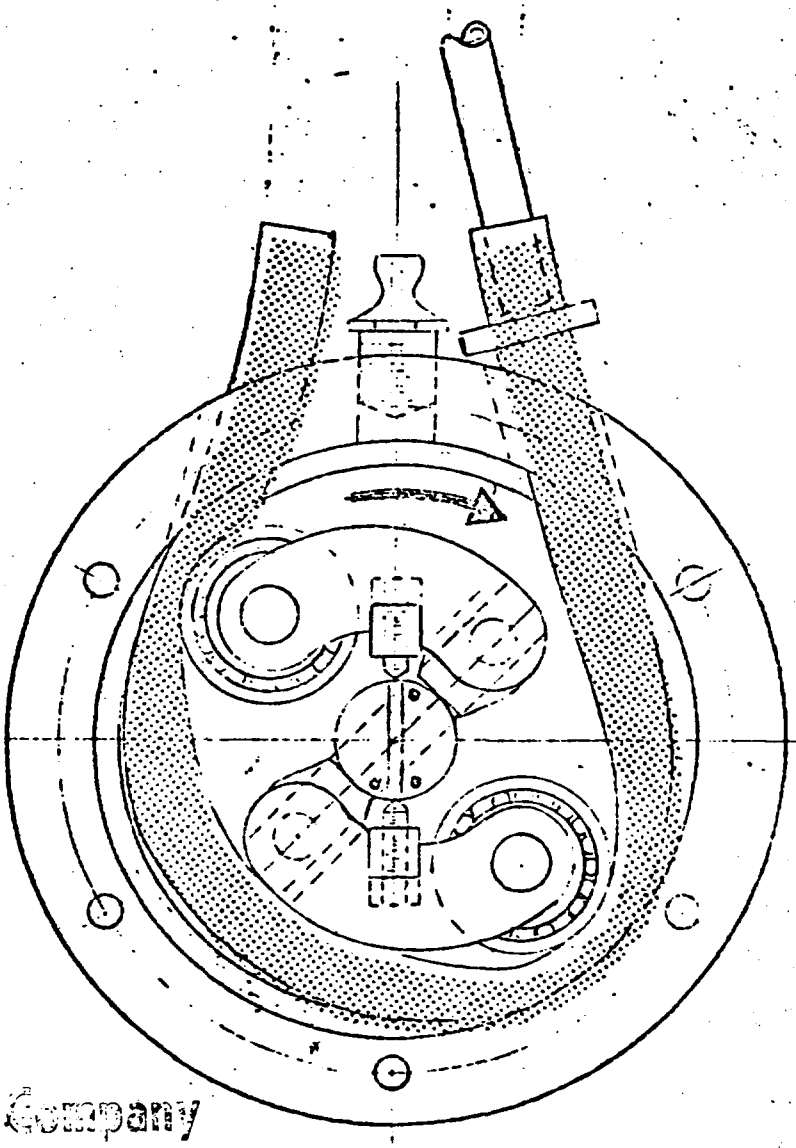
PARTS LIST

WS-10	TWO STEP PULLEY
WS-11	2 RPM 1/65 HP 110 V MOTOR
WS-12	PERISTALTIC PUMP
WS-13	TEFLON RETAINER
WS-14	3/16" ID 3/32" WALL TK. TIGON TUBING
WS-15	3/16" ID 1/16" WALL TK TIGON TUBING
WS-16	TIMER BRONZE SPROCKET
WS-17	1 RPM TIMER MOTOR
WS-18	LADER CHAIN
WS-19	ELECTRIC OUTLET BOX
WS-20	DRIVING SHAFT BRONZE SPROCKET
WS-21	HOLDING WIRE
WS-22	S.S. THREADED DRIVING SHAFT
WS-23	PLASTIC THROUGH
WS-24	PLASTIC CLOTH-PIN
WS-25	S.S. BOX COVER
WS-26	1/4" O.D x .040" WALL TK. POLYETHYLENE TUBING



AUTOMATIC SHIFT SAMPLER

PERISTALTIC PUMP



Paul Noakeohe Company
POLUTION CONTROL SAMPLING EQUIPMENT
805 ILLINOIS AVENUE
COLLINSVILLE, ILLINOIS 62234

END VIEW

(COVER PLATE REMOVED)

AUTOMATIC SHIFT SAMPLER (10 x 8 hr. Sampler)

The sampler box is made of "Benelex". Material of the box cover is stainless steel 316 corrugated sheet. The construction of the box insures a free corrosion operation in the open at subzero temperatures.

The automatic sampler can be set for three days, allowing operation over the weekend without attention.

The box is designed to hold 10 wide mouth one gallon sample jars (not furnished).

The box cover is insulated with styrofoam blanket and the box can be winterized easily since it has enough electric outlets to hold heat lamps, mats, tapes, etc.

We can furnish a conversion kit to take 24 x 1 hr. continuous samples, or we can discuss your needs and furnish a kit to take X x X hr. samples.

Dimensions		Weights	
Length	48"	Benelex box	72 lbs.
Width	16"	Pump Unit (complete)	15 lbs.
Height	22"		

PERISTALTIC PUMP

Sample pump consists of a 3/16" I.D. x 3/8" O.D. Mayon tubing which is progressively compressed by planetary movement of two rollers.

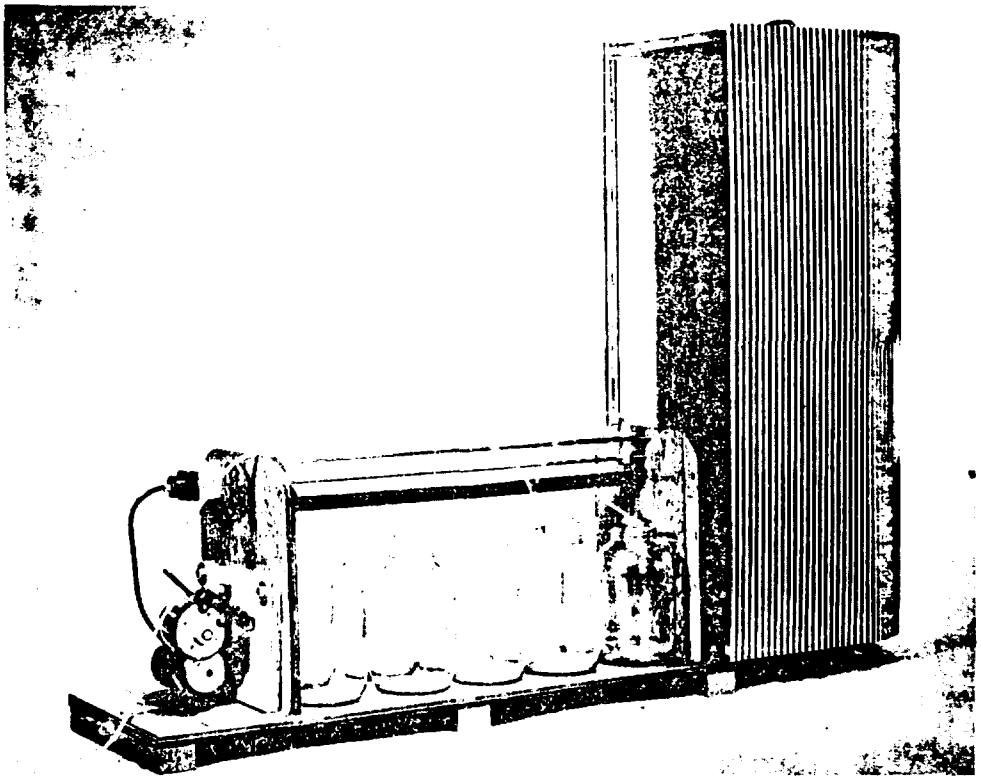
Speed regulation is accomplished by a variable pump pulley and with a two step motor pulley.

The electric motor is a 2 RPM, 110V, 1/60 HP, clockwise rotation. For faster sample delivery, we can furnish faster motors.

When in good condition, the pump will pull vacuum over 30" Hg, also can lift liquids to a considerable height (30 ft. max.) or through long lengths of suction tubing.

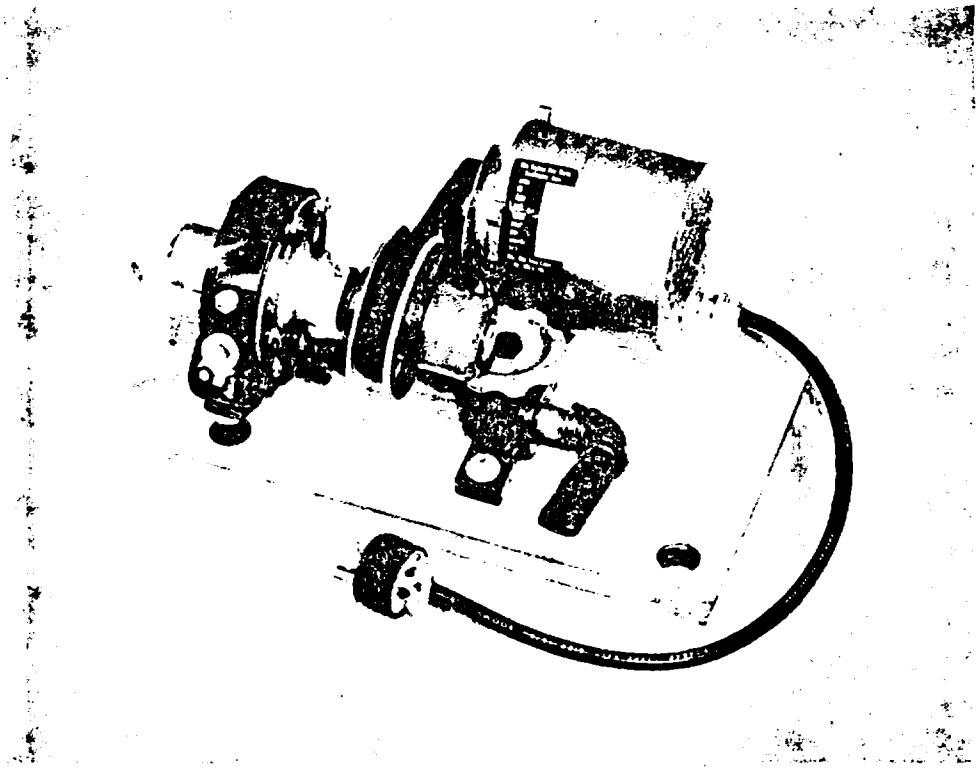
With full speed and with new tubing, the sample delivery is about one gallon for an 8 hour shift.

Paul Noascono Company
POLUTION CONTROL SAMPLING EQUIPMENT
805 ILLINOIS AVENUE
COLLINSVILLE, ILLINOIS 62234



AUTOMATIC SHIFT SAMPLER

Takes 10 x 8 hr. continuous
samples without attention.



PERISTALTIC PUMP

with 2 R.P.M. 110 A.C. Motor

Paul Noascono Company
POLUTION CONTROL SAMPLING EQUIPMENT
805 ILLINOIS AVENUE
COLLINSVILLE, ILLINOIS 62234

AUTOMATIC SHIFT SAMPLER OPERATION

Sample pump consists of a 3/16" I. D. x 3/8" O. D. Mayon tubing which is progressively compressed by planetary movement of two rollers. The rotation should be always clockwise.

Through wear or deforming of the parts, clearances eventually increase so the pump tubing is no longer firmly compressed. Most of the time, changing to new tubing will restore the necessary vacumn. When the vacumn is not restored, even with a new tubing, an adjustment will be necessary. To do this, unscrew the grease fitting and adjust slightly the compression of the rollers with an Allan wrench. It is recommended the rollers be adjusted with a vacumn gauge. To locate the adjusting screws, the shaft is marked with one and two notches. (See drawing for details)

We recommend to use silicon grease to insure the life of the Mayon tubing.

Sample suction tubing is normally 1/4" O.D. x 3/16" I.D. Polyethylene tubing (not furnished).
The free end of the suction tubing (in the waste stream) should be weighted slightly in order to keep it from floating and drawing air.

Too heavy weighting will cause the tubing end to dip into the sludge, and will cause excessive plugging.

Samples collected will not be representative as regards solid content.

Paul Noascono Company
POLUTION CONTROL SAMPLING EQUIPMENT
805 ILLINOIS AVENUE
COLLINSVILLE, ILLINOIS 62234

CERRO COPPER & BRASS COMPANY
DIVISION OF CERRO CORPORATION

ST. LOUIS WORKS
P. O. BOX 681
EAST ST. LOUIS • ILLINOIS 62202
618-337-6000

December 28, 1971

Environmental Protection Agency
Office of Water Programs
Division of Technical Support
Washington D. C. 20242

Attention: Mr. J. L. Lewis

Dear Mr. Lewis:

On October 29, 1971 I wrote to you in connection with our company's report of industrial waste water discharges which was delayed beyond the suggested 90-day period from September 1, 1971 due to our desire to complete certain construction projects within our plant which would influence the information to be submitted. It was our hope at that time that we could submit the completed forms in late December 1971.

We are happy to report at this time that our construction work is essentially completed and the improvements which were designed to reduce the contamination of our sewers are now in service.

We will need additional time to perform the flow measurements and sample analyses necessary to present you with meaningful data. It is our hope to perform the field work in January and to complete the calculations and reports in early February. At such time as this information is compiled, we will file the reports requested by your agency.

We trust that you are not too greatly inconvenienced by this delay, but assure you that we are interested in giving you the most accurate information possible. An acknowledgment of this letter would be appreciated.

Yours very truly,

CERRO COPPER & BRASS COMPANY
DIVISION OF CERRO CORPORATION

Paul Tandler
Technical Manager

BCC: W. E. Dunnick
J. W. Goldenberg
W. P. Lorenz
File 1104

Mr. Jerry Jones
Monsanto Enviro-Chem

C311-10

CERRO COPPER & BRASS COMPANY
DIVISION OF **CERRO CORPORATION**

INTERNAL MEMORANDUM

Form HQ-10 SHOW NAME, TITLE AND CORPORATION OF ADDRESSEE AND ADDRESSOR

OTHER ADDRESSEES • FOR INFORMATION

cc: R. O. Wigger
J. W. Goldenberg
R. E. Conreaux
W. P. Lorenz
W. G. Graff
File 1104
G. W. Vose-Cerrocor

TO: W. E. Dunnick, Vice President DATE: November 22, 1971

FROM: P. Tandler, Technical Manager

SUBJECT: REVISED EFFLUENT CRITERIA AND WATER QUALITY STANDARDS

I have just received an advance copy of data to be published by the Illinois Pollution Control Board in its next newsletter, relating to a proposed final draft of these regulations which have been discussed at various public hearings in the past six months.

My copy is attached for your perusal but I thought it best to give you a brief overview of the changes now proposed by the Board, as they have a profound effect on our future plans for internal waste treatment:

1. Copper:

The copper standard for effluents has been revised upward from .04 mg/l (ppm) to 1.0 mg/l. This suggests that neither Cerro nor the Village of Sauget treatment plant will have to make any special provisions for the removal of copper inasmuch as this standard can be met with the presently proposed secondary treatment scheme at the treatment plant.

The news release suggests that presently available technology makes the earlier proposed standard too difficult to meet and reference is made to testimony rendered by the Village of Sauget and Olin Corporation, who, incidentally, were recently granted a variance to 1.0 mg/l to enable construction of a $6,000,000 treatment facility at East Alton.

2. Total Metals:

This criterion has been completely dropped from the final draft as the original proposed effluent standard of 2.0 ppm for total metals was based on the possible synergistic effects of certain metals in combination rather than on any evidence as to achievability concentrations, and there

C311-11

seems to be no evidence to support this standard as economically or technically feasible.

3. Total Dissolved Solids:

The originally proposed effluent standard of 750 mg/l has been raised to 3500 mg/l. Although this change does not affect Cerro directly, it is a very desirable change from an overall standpoint, as it encourages the recycling of water with the attendant increase in dissolved solids concentration, which ultimately will have to be discharged to the river. The testimony given by the Village suggested a standard of 1500 to 2000 mg/l, and this is, of course, an even more liberal standard.

4. Dilution:

The initially proposed regulations indicated that the effluent standards would have to be met without any allowance for dilution. Prior to this final draft, the Board published a revised standard proposal that retained the general prohibition of dilution while leaving some room for engineering judgement as to the desirability of separating or combining waste streams for treatment. In both cases, a deliberate dilution procedure in lieu of treatment is prohibited. The final proposal is in line with that revised standard.

5. Background Concentrations:

This subject relates to contaminants already present in a water supply, such as deep well or river water, and it was suggested during the hearings that credit should be given for impurities already contained in a plant's water supply. Rather than to make a definite ruling on this subject the Board feels that a case-by-case approach should be taken.

6. Other Heavy Metals:

We have been previously advised by our consultants that such metals as iron, lead, zinc, nickel, and cadmium discharged from our plant in low concentrations would not present any problems to the secondary treatment facility. Several of these metals have been retained as previously proposed, others have been made more liberal and we, therefore, are not affected by the new proposal.

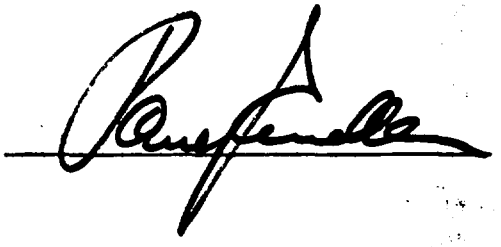
7. Mercury:

The mercury standard of .0005 mg/l (0.5 parts per billions) which was adopted in March, 1971 will stand in its present form. This is Federal law. We have taken several readings in our own plant to check on compliance and find that in some instances we have complied, while in others we have been above the allowable limit. I have not resolved to this date the effect on the treatment plant of Cerro's mercury content, but in the light of Monsanto Company's vastly greater amount of mercury discharge, I am sure that some sort of variance will have to be sought by the Village together with Monsanto Company, and that our small mercury discharge will probably have little bearing on the overall situation. In view of the location of these mercury trace discharges within our own plant, I must assume that these are contained in our incoming scrap rather than caused by accidental dumping from instrumentation within the plant.

8. Combined Sewers and Treatment Plant By-Passes:

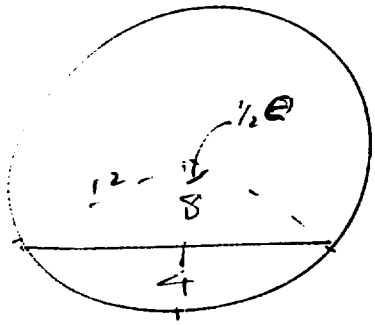
The Board is a little vague about its future plans on this subject. It will be recalled that, following the publication of its proposed regulations, it indicated that storm water collected in combined sewers with sanitary and industrial waste would have to be subjected to secondary treatment to meet the effluent standards. It is now proposed that the degree of treatment required not be specified except that it must include as a minimum the equivalent of primary treatment and disinfection. However, it is also stated that if additional measures later prove necessary, they can later be required. This, in my opinion, throws a considerable question into the matter of sizing the secondary treatment facility for the Village.

The Board has proposed two additional hearings for the review of its final draft, with dates to be announced shortly, and, although the environmentalists may protest the somewhat more liberal standards, it is felt that these final proposals have a good chance of being adopted as regulations. I will make it my business to attend one of the hearings, with your approval.



PT:cm
Atch.

11/24



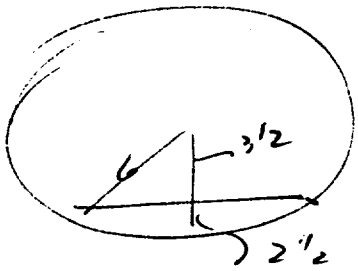
24" 4"
35 RPM
#5 BAFLING
TO D.C.

$\cos \frac{1}{2}\Theta = \frac{8}{12} = .666$ or $48°11'$

$\Theta = 96\frac{1}{2}°$

$C_{area} = .3405 \times 144 = 49$ sq in
$= .345$ sq ft

35 counts = 1.3 ft/sec
in 60 sec $= .45$ cu ft/sec
$= 26.9$ cu ft/min
$= 200$ gpm.



12" 2½
55 RPM

$\cos \frac{1}{2}\Theta = \frac{3.5}{6} = .5833 = 54°20'$

$\Theta = 109°$

$C_{area} = 4.78 \times 36 = 17.2$ sq in
$= .12$ sq ft.

55 counts = 2.02 ft/sec
$= .22$ cu ft/sec
$= 13.3$ cu ft/min
$= 100$ gal/min

SCIENTIFIC INSTRUMENTS
OF WISCONSIN INC
518 W CHERRY ST
MILWAUKEE WISC
53212

C311-12

CERRO COPPER & BRASS COMPANY
DIVISION OF CERRO CORPORATION

ST. LOUIS WORKS
P. O. BOX 681
EAST ST. LOUIS • ILLINOIS 62202
618-337-6000

October 29, 1971

NOASCONO 344-3706

Paul Noascono Co.
Pollution Control Sampling Equipment
805 Illinois Ave.
Collinsville, Illinois 62234

Gentlemen:

We have a circular covering your Fig. C. Automatic Shift Sampler, and would like to have some additional information covering other models suitable for 24 hour sampling, together with delivery and pricing information.

Very truly yours,

CERRO COPPER AND BRASS COMPANY
Division of CERRO CORPORATION

W. G. Graff
Engineering Department

WGG/as

Enclosure

BCC: File 1900 A

C311-13

PANOCO

POLLUTION CONTROL
SAMPLING EQUIPMENT

Paul Noascono Company

PHONE: 618-344-3706

805 ILLINOIS AVENUE • COLLINSVILLE, ILLINOIS 62234

Gentlemen:

The enclosed brochure shows our automatic sewer sampler which has been fully tested for several years by many chemical companies, as well as government agencies.

The sampler was designed mainly for chemical plants where the enviroment is corrosive. The materials are corrosion proof. At the same time the moving parts have been designed for a continuous work under severe conditions.

The sampler can be winterized by using electric heating elements, such as mats, tapes, flood lamps, etc. The box is provided with enough electric outlets for this service.

We are in a position to ship 6 samplers within 3 weeks notice.

The price of the complete unit is $320.-F.O.B. Collinsville, Illinois. We can furnish the pump unit only, at $150. each.

Yours very truly,
The Paul Noascono Company

Paul Noascono

Paul Noascono

C311-14

AUTOMATIC SHIFT SAMPLER (10 x 8 hr. Sampler)

The sampler box is made of "Benelex". Material of the box cover is stainless steel 316 corrugated sheet. The construction of the box insures a free corrosion operation in the open at subzero temperatures.

The automatic sampler can be set for three days, allowing operation over the weekend without attention.

The box is designed to hold 10 wide mouth one gallon sample jars (not furnished).

The box cover is insulated with styrofoam blanket and the box can be winterized easily since it has enough electric outlets to hold heat lamps, mats, tapes, etc.

We can furnish a conversion kit to take 24 x 1 hr. continuous samples, or we can discuss your needs and furnish a kit to take X x X hr. samples.

Dimensions		Weights	
Length	48"	Benelex box	72 lbs.
Width	16"	Pump Unit (complete)	15 lbs.
Height	22"		

PERISTALTIC PUMP

Sample pump consists of a 3/16" I.D. x 3/8" O.D. Mayon tubing which is progressively compressed by planetary movement of two rollers.

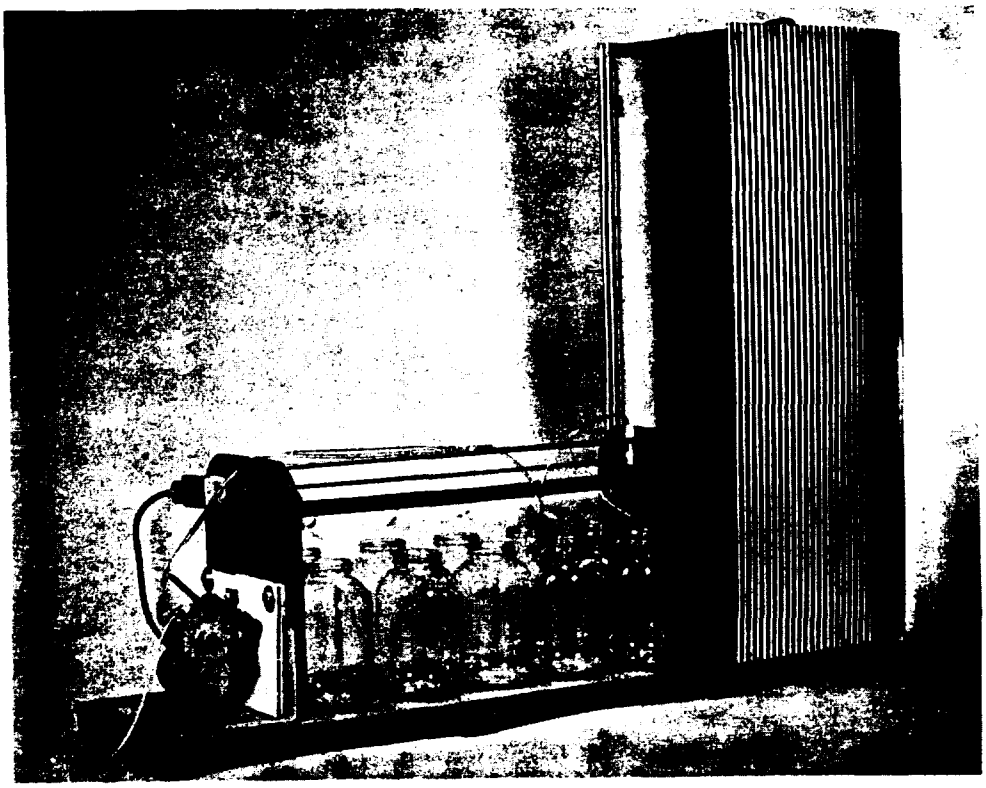
Speed regulation is accomplished by a variable pump pulley and with a two step motor pulley.

The electric motor is a 2 RPM, 110V, 1/60 HP, clockwise rotation. For faster sample delivery, we can furnish faster motors.

When in good condition, the pump will pull vacuum over 30" Hg, also can lift liquids to a considerable height (30 ft. max.) or through long lengths of suction tubing.

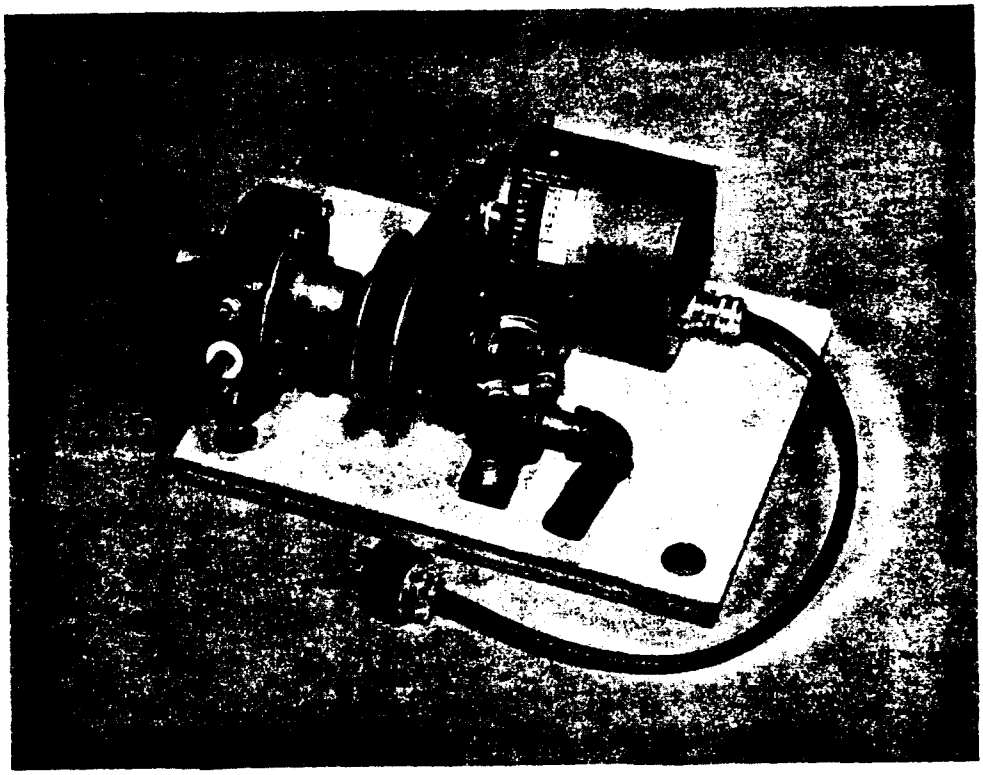
With full speed and with new tubing, the sample delivery is about one gallon for an 8 hour shift.

Paul Noascono Company
POLUTION CONTROL SAMPLING EQUIPMENT
805 ILLINOIS AVENUE
COLLINSVILLE, ILLINOIS 62234



AUTOMATIC SHIFT SAMPLER

Takes 10 x 8 hr. continuous samples without attention.



PERISTALTIC PUMP

with 2 R.P.M. 110 A.C. Motor

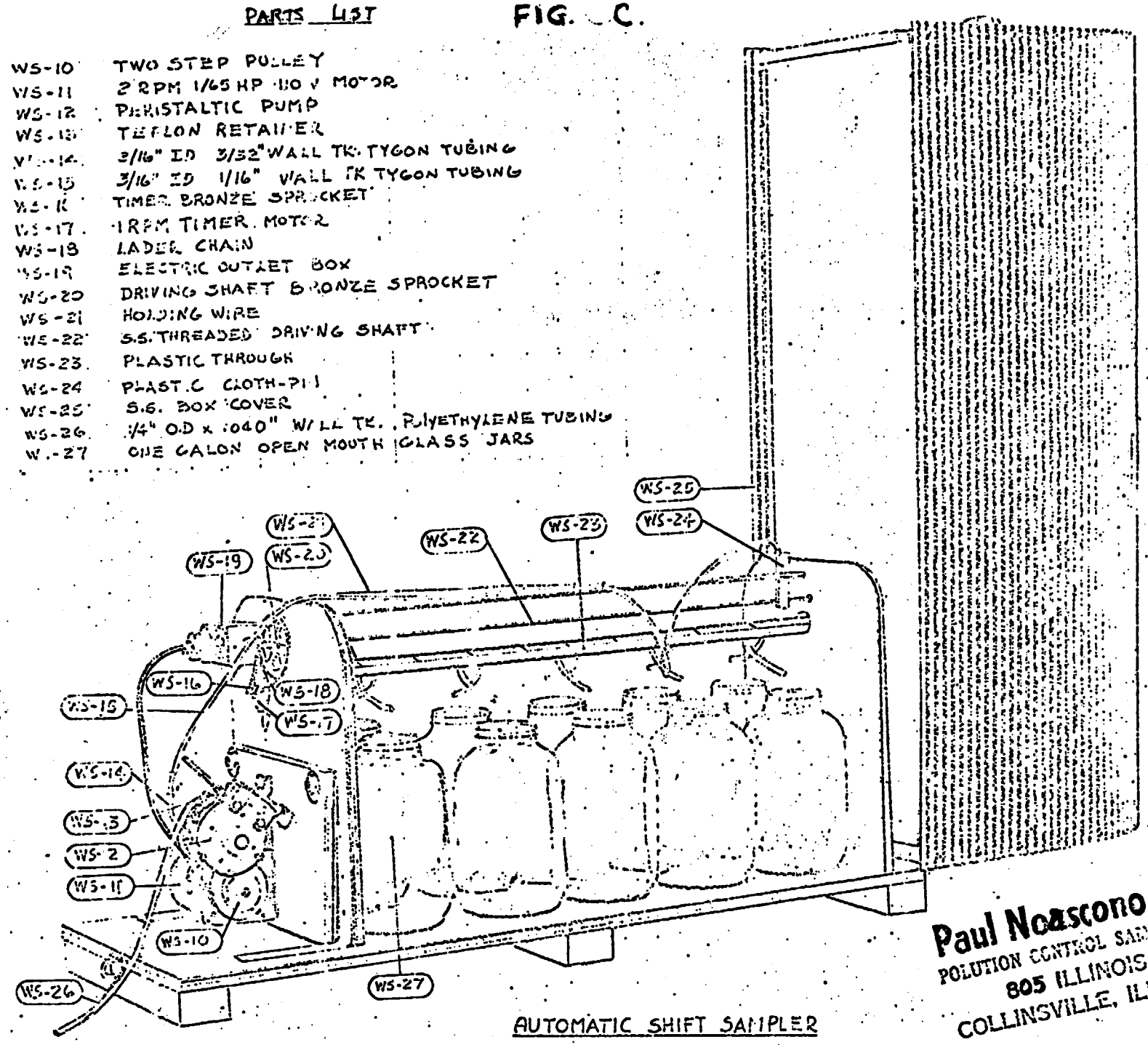
Paul Noascono Company
POLUTION CONTROL SAMPLING EQUIPMENT
805 ILLINOIS AVENUE
COLLINSVILLE, ILLINOIS 62234

C311-15

PARTS LIST

FIG. C.

WS-10	TWO STEP PULLEY
WS-11	2 RPM 1/65 HP 110 V MOTOR
WS-12	PERISTALTIC PUMP
WS-13	TEFLON RETAINER
WS-14	3/16" ID 3/32" WALL TK. TYGON TUBING
WS-15	3/16" ID 1/16" WALL TK TYGON TUBING
WS-16	TIMER BRONZE SPROCKET
WS-17	1 RPM TIMER MOTOR
WS-18	LADER CHAIN
WS-19	ELECTRIC OUTLET BOX
WS-20	DRIVING SHAFT BRONZE SPROCKET
WS-21	HOLDING WIRE
WS-22	S.S. THREADED DRIVING SHAFT
WS-23	PLASTIC THROUGH
WS-24	PLASTIC CLOTH-PIN
WS-25	S.S. BOX COVER
WS-26	1/4" O.D x .040" WALL TK. POLYETHYLENE TUBING
WS-27	ONE GALON OPEN MOUTH GLASS JARS



AUTOMATIC SHIFT SAMPLER

Paul Noascono Company
POLUTION CONTROL SAMPLING EQUIPMENT
805 ILLINOIS AVENUE
COLLINSVILLE, ILLINOIS 62234

Color	Cadmium
Turbidity	Chromium
Hardness	Iron
Oil & Grease	Mercury
Fluoride	SEE NOTE BELOW
Arsenic	

SIC 333 & SIC 334 PRIMARY SMELTING AND REFINING OF NONFERROUS METALS; SECONDARY REFINING OF NONFERROUS METALS

Establishments primarily engaged in smelting copper from ore and refining, except rolling, drawing or extruding (SIC 3351); smelting lead and zinc from ore and refining, except rolling, drawing and extruding (SIC 3356), production of aluminum and refining, except rolling, drawing or extruding (SIC 3352).

Oil & Grease	Chromium
Chloride	Copper
Fluoride	Lead
Aluminum	Mercury
Antimony	Silver
Arsenic	Zinc
Cadmium	SEE NOTE BELOW

SIC 336 NONFERROUS FOUNDRIES

This group includes establishments primarily engaged in manufacturing castings and die castings of aluminum, brass, bronze and other nonferrous metals and alloys. These establishments generally operate on a job or order basis, manufacturing castings for sale to others or for interplant transfer. Establishments which produce nonferrous castings and which are also engaged in fabricating operations, such as machining, assembling, etc., in manufacturing a specified product are classified in the industry of the specified product. Nonferrous castings are made to a considerable extent by establishments classified in other industries that operate foundry departments for the production of castings for incorporation, in the same establishment, into such products as machinery, motor vehicles, etc. Establishments primarily engaged in manufacturing iron and steel are classified in Group 332.

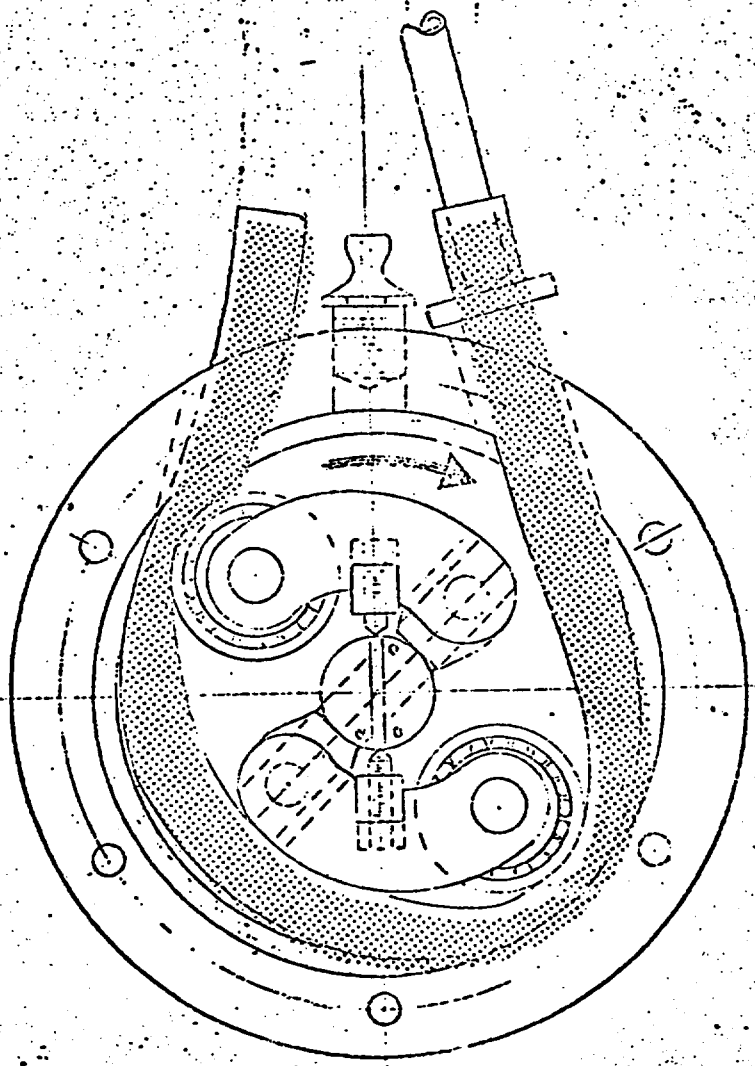
Fluoride	Chromium
Oil & Grease	Copper
Aluminum	Lead
Antimony	Zinc
Arsenic	SEE NOTE BELOW
Cadmium	

NOTE: If it is certain that one or more of the designated parameters is not present in the initial untreated or treated intake water and/or the discharge, enter "A" (meaning "absent") in the appropriate space.

FIG. C-1

Bill Graff.

PERISTALTIC PUMP



END VIEW

(COVER PLATE REMOVED)

Paul Norsono Company
POLUTION CONTROL SAMPLING EQUIPMENT
805 ILLINOIS AVENUE
COLLINSVILLE, ILLINOIS 62234

C311-17

$$1\ ppm = 1\ mg/l = 1\ \mu g/ml = 1\ \frac{lbs}{10^6\ lbs}$$

~~$\mu g = 10^{-6}\ gm$~~

~~$\mu g/ml$~~

~~$\mu g = ml \times 10^{-3}$~~

$$1\ ppm = \frac{1\ ton}{10^6\ ton}$$

Bill-
Will file with water
Pollution Abatement
Joe

ILLINOIS

STATE CHAMBER OF COMMERCE

20 NORTH WACKER DRIVE • CHICAGO 60606 • (312) 372-7373

7/1
Paul:
We have other
copies of this
Is there anyone who
could use this?
E.

June 18, 1971

TO SELECTED MEMBERS OF THE ILLINOIS STATE CHAMBER OF COMMERCE:

Enclosed is a copy of the proposed water quality standards, set forth by the Illinois Pollution Control Board on May 12. This reprint is taken verbatim from the Newsletter of the Pollution Control Board, issue number 22, dated May 19. We feel certain you and your environmental quality personnel will want to examine the proposed standards as they relate to your company.

Hearings on the proposed standards began in Evanston, June 17-18. Additional hearings have been scheduled for Rockford, June 24; Galena, June 25; Granite City, June 29 and Carbondale, June 30.

The Pollution Control Board and the Illinois State Chamber of Commerce urge the people of the State to participate in the hearings which the Board states will determine the uses for which Illinois waters will be maintained and assess the costs that water quality enhancement will entail.

It is important that the Pollution Control Board hear your statements as to the reasonableness and practicability of the proposed standards. It will also be most helpful if you can communicate your findings to me. Any data which you think will be helpful in the preparation of State Chamber testimony will be gratefully received.

Sincerely,

Hal Crater

HCC:mb
Enc.

Harold C. Crater, Manager
Community Development Department

Joe:

I think you and Bill Graff should keep this copy for your reference.

Paul

C311-19

ILLINOIS POLLUTION CONTROL BOARD

EXPLANATION OF PROPOSED WATER QUALITY STANDARDS REVISIONS - #R71-14
(Proposed May 12, 1971)

On May 12, the Board authorized hearings on a proposal which would completely revamp the State's water pollution control regulations. The purpose of the revision is to establish for the first time in a single document a consistent and coherent set of regulations covering water quality criteria for various uses, stream use designations, effluent requirements and all other requirements necessary for the protection of the State's waters. The revision, however, with its emphasis upon effluent standards as an enforcement tool to insure the attainment of water quality goes beyond a mere codification of existing rules. In addition, the hearings on the proposal will permit the people of the State to have a say in the uses for which their waters will be maintained as well as an opportunity to assess the costs that various levels of water quality enhancement will entail. It should be emphasized that the proposal is just that, a proposal, not a final set of regulations. It is only by weighing the testimony resulting from the public hearings that the Board will be able to determine exactly what the final regulations should contain.

The proposal contains many improvements on existing regulations which will serve to better protect the State's aquatic environment. The changes include the addition of more numerical criteria to facilitate enforcement and to make clear the responsibilities of individual waste dischargers. Key requirements for aquatic life such as dissolved oxygen, ammonia and toxic substances have been strengthened and the area subject to these requirements has been expanded by requiring that aquatic life be protected in all but a few waters of the State. In order to accomplish the goals expressed in the water quality standards improved waste treatment will be required. In addition to the effluent criteria being considered separately, R 70-8, this proposal would require a number of additional communities and industries to provide levels of treatment beyond secondary and would require year around disinfection of all bacteria bearing wastes. The proposal also sets new, earlier dates for the elimination of the pollution resulting from the discharge of raw sewage from combined sewer overflows and requires interim treatment of these flows by the middle of next year.

Certain existing high quality waters of the State require protection which cannot be afforded if they are to be used for waste assimilation. The proposal would prohibit new waste sources on a number of specified streams and would require the highest level of treatment for all existing sources.

Distributed by the
Community Development Dept.
Illinois State Chamber of Commerce
20 North Wacker Drive
Chicago, Illinois 60606

The following is a section by section discussion of the proposal outlining the reasons for each section and explaining how it differs from existing regulations. Under the Board's regulation numbering system, water pollution rules are contained in Chapter IV.

Part I: Introduction.

Sections 101 and 102 - These sections contain references to the Board's statutory authority to enact water pollution control regulations and describes the purposes for enacting specific types of regulations.

Section 103 - This section repeals the existing regulations upon enactment of the new ones, but preserves the applicability of the old regulations to cases arising before the effect date of the new ones.

Section 104 - This section defines certain terms used in the Chapter.

Section 105 - This section specifies the methods of sample collection, preservation and analysis which are to be used to determine whether the regulations are being met.

Part II: Water Quality Criteria.

This part prescribes the water quality criteria which must be maintained to protect the specified uses. It should be noted that waters designated for more than one use, as most waters in Illinois will be, must meet the most restrictive criteria for a given contaminant of any of the protected uses.

Section 201 Mixing Zones. - This section defines the area permitted for the mixing of effluents with the waters of the State and imposes special limitations on such zones in waters designated for aquatic life. Stream water quality standards are usually more restrictive than effluent standards and therefore an opportunity must be afforded for the mixing of effluents with their receiving waters. Six hundred feet is the limit on mixing zones in the present regulations and it is retained in the proposal.

Section 202 Stream Flows. - This section specifies the stream flows during which the water quality standards apply. The standards must be met during all but extreme low flow periods.

Section 203 General Criteria. - This section differs from existing regulations in that it specifies most uses, including aquatic life and secondary contact, as applying to all of the waters of the State except where specifically exempt. The general criteria therefore become the basic minimum standards which must be met at nearly all places. This method of broad use designation is superior to that of identifying by name all lakes, streams, and stream sectors in the State, an exercise which, no matter how exhaustive, could result in some waters being overlooked and therefore unprotected. In addition, there are numerous pollutants such as mercury and other toxic metals, visible oil and floating debris which should not be tolerated in any waters regardless of their use designation. The application of the general criteria to all waters of the State will make clear to all concerned the basic water quality requirements.

Section 203 (a): This section contains general non-numerical criteria. The criteria are stronger than existing regulations in that the existance of nuisance conditions would no longer be necessary to prove a violation. Sludge or bottom deposits either organic or inorganic can disturb bottom dwelling organisms and thus upset the natural food chain. The decomposition of organic deposits may depress dissolved oxygen values. Floating debris, visible oil, unnatural color and turbidity, are, of course, aesthetically unpleasing as well as having potential toxic effects.

Section 203 (b): The limit on pH in the proposal is the same as that in the existing regulations for aquatic life sectors. It also conforms to the limit recommended by the National Technical Advisory Committee on Water Quality Criteria (NTAC). A number of streams in the southern part of the State affected by acid mine drainage do not presently meet the pH standard.

The STORET number used here and elsewhere on numerical criteria refers to the code assigned to a particular water quality parameter in the Federal Environmental Protection Agency's water quality data system. Its use identifies with greater precision the specific form of the contaminant in question.

Section 203 (c): The phosphorus limit for streams is that recommended by the NTAC to reduce the possibility of algal blooms. The proposed standard is presently exceeded in a large number of Illinois streams.

Section 203 (d): Closely associated with the phosphorus limitation is the proposed limit on total algae, which is designed to identify and prohibit nuisance blooms and thus point toward areas

requiring additional nutrient control. A number of researchers have suggested that 500 organisms per 100 ml constitutes an algal bloom (Lackey, Evans, Wisconsin Committee on Water Pollution) and that level is proposed here. The Fox River and Lake Michigan both suffer from algae growths in excess of the proposed limit and improved monitoring and research may point to other problem areas in the State.

Section 203 (e): The minimum acceptable dissolved oxygen limits have been raised by 1 mg/l over existing standards. The NTAC report indicates that the existing standard may be "close to the borderline" for desirable aquatic life over extended periods. The proposed standard increases the margin of safety and will help to insure good populations of fish.

Section 203 (f): The proposed standard for radioactivity is more restrictive than the existing one and applies to all waters of the State, not only to those designated for water supply use. The proposed limits are identical to those considered desirable by the NTAC.

Section 203 (g): This section lists specific numerical limits for various chemical constituents. Most of these proposed limits are based upon the toxicity of the contaminant to aquatic life.

Ammonia Nitrogen - Present standards, with the exception of SWB-8 (Illinois River), generally prescribe no limit on ammonia nitrogen in streams for aquatic life. The NTAC report suggests that ammonia levels should not exceed 1.5 mg/l at pH values above 8.0. The State of Minnesota has adopted 1.0 mg/l as its ammonia standard for class (b) waters (Sport and commercial fishing) and that level is proposed here. The proposed standard is exceeded in many Illinois waters.

Arsenic - Present regulations generally contain no standard for arsenic for aquatic life. The proposed standard of 1.0 mg/l is based upon the proof of harm to aquatic life contained in Water Quality Criteria by McKee and Wolf, State of California Water Quality Control Board (McKee and Wolf). Arsenic is also designated as a toxic substance and subject to the additional restrictions of Section 203 (h).

Barium - There is generally no existing limit on barium for aquatic life. The proposed standard of 5.0 mg/l is based upon the limit recommended by McKee and Wolf which is related to its toxic effects.

Five-day Biochemical Oxygen Demand (BOD_5) - Present regulations contain limits on BOD_5 only as an effluent standard. Excessive oxygen demanding wastes in a river can result in the depletion of

oxygen needed by aquatic life. Thus a stream BOD_5 limit provides an important curb on the waste loads which can be discharged in a given stream sector or reach. In addition, because the effluent standards for BOD_5 are based, in part, upon the amount of stream dilution available, the establishment of a stream BOD_5 standard will ensure that a series of waste discharges do not create a situation where the stream itself is composed primarily of unassimilated effluents. The proposed standard of 7.0 mg/l taken together with the dilution ratio limits contained in the effluent criteria part of the proposed regulations should assure the attainment of the dissolved oxygen standards required for aquatic life.

Boron - There is no limit on boron in the existing regulations. The proposed restriction of 1.0 mg/l is based upon the need to prevent buildup of boron on lands which are irrigated. Agricultural water use is protected by the general criteria.

Cadmium - The proposed limit of 0.05 mg/l for cadmium is presently included in SWB-8 and is based upon its toxicity. Cadmium can concentrate in fish and also acts synergistically with other substances to cause increased toxicity (McKee and Wolf). Cadmium has been designated a toxic substance.

Chromium - SWB-8 contains an existing limit on hexavalent chromium for aquatic life of 0.05 mg/l. Both trivalent and hexavalent forms can be toxic to aquatic life. McKee and Wolf recommend a 0.05 mg/l limit for both forms combined and that is the level proposed here. Chromium is designated a toxic substance.

Copper - Existing limits on copper for aquatic life vary from 0.02 mg/l to no limit. Based upon toxicity to aquatic life McKee and Wolf recommend a limit of 0.02 mg/l and this is the present proposal. Copper is also designated a toxic substance and is subject to the restriction contained in 203 (h).

Cyanide - Present regulations SWB-8 and SWB-12 (Mississippi River) contain a limit on cyanide for aquatic life of 0.025 mg/l. The proposed limit of 0.01 mg/l is based upon its toxicity toward fish and also on the fact that proper treatment can achieve that level. (Public Health Service - Drinking Water Standards). Cyanide is designated a toxic substance.

Fluoride - There is no existing limit on fluoride for aquatic life. The proposed limit of 1.4 mg/l is based upon its toxicity to aquatic life (McKee and Wolf).

Iron - The present regulations for the Illinois River (SWB-8) contain an existing limit on iron for aquatic life of 1.0 mg/l. That same limit of 1.0 mg/l is proposed here based upon its toxicity to aquatic life (McKee and Wolf).

Lead - Except for SWB-8 and SWB-12, there is generally no existing standard for lead for aquatic life. The proposed limit of 0.1 mg/l which is the present SWB-8 and 12 standard is based upon its toxicity to fish life (McKee and Wolf). Lead is designated a toxic substance.

Manganese - There are no existing standards for manganese for aquatic life. The proposed limit of 1.0 mg/l is based upon its toxicity to aquatic life (McKee and Wolf).

Mercury - The limits for mercury were determined in a separate series of hearings #R 70-5. Mercury is designated a toxic substance.

Nickel - Present aquatic life standards do not set a limit for nickel. The proposed limit of 1.0 mg/l is based on its toxicity to aquatic life. (McKee and Wolf). Nickel is designated a toxic substance.

Phenols - Except for SWB's 8 and 12 which have a 0.2 mg/l limit, present aquatic life standards generally do not include limits on phenols. Phenols are toxic to aquatic life and cause tainting of fish flesh. The proposed limit of 0.1 mg/l is designed to protect against both harmful effects (NTAC Report).

Selenium - There are no existing aquatic life limits on selenium. The proposed standard of 2.0 mg/l is based upon its toxicity to fish (McKee and Wolf). Selenium is designated a toxic substance.

Silver - SWB-8 and SWB-12 contain existing aquatic life limits on silver of 0.05 mg/l. The proposed limit of 0.005 mg/l is based upon its toxicity to fish (McKee and Wolf). Silver is designated a toxic substance.

Zinc - SWB-8 and SWB-12 contain limits on zinc of 1.0 mg/l for aquatic life. The proposed criteria of 1.0 mg/l is based upon its toxicity to fish (McKee and Wolf). Zinc is designated a toxic substance.

Section 203 (h): Many toxic substances exhibit a characteristic known as synergism. That is their toxic effects in combination are greater than would be expected by a simple linear relationship of their concentrations. It would be impossible to design an enforceable regulation which would take into consideration all synergistic effects. The proposed total limit of 2.0 mg/l of all contaminants designated as toxic substances provides additional protection against synergistic effects which is not afforded by the individual limits on each contaminant. The maximum permitted level is equal to the highest value allowed for a single parameter (selenium).

Section 203 (i): The proposed bacterial standard is identical to the existing one for secondary contact recreation and is in agreement with the recommendations of the NTAC.

Section 203 (j): Present standards for aquatic life do not include specific limits on pesticides. The proposed limits on 98 pesticides are one-tenth of the 48-hour median tolerance limit (48 hr. TLm) for fish contained in the NTAC report. The 48-hour median tolerance limit is the concentration of the tested material which one half of the test organisms are just able survive exposure for the time period cited.

Section 203 (k): No regulation could possibly contain all of the potential environmental contaminants. This standard, which is identical to the one in the existing regulations, provides a blanket restriction on all toxic substances. Since the establishment of a standard at the TLm level itself could result in fish kills the TLm is divided by a factor of 10 to provide a safe concentration (NTAC report).

Section 203 (l): Existing stream standards for temperature for aquatic life use specify a 90° F. maximum during the months of April to November and a 60° maximum during December to April. In addition, no more than a 5° F. cumulative change from natural water temperature is permitted. The proposed standard, which is based upon data provided by the Federal Environmental Protection Agency, retains the 5° F. rise limitation and substitutes a series of monthly maxima which are not to be exceeded. The application of these proposals to the Mississippi, Wabash and Ohio Rivers is being considered in hearings already scheduled, R 70-16 and R 71-12.

Section 204: Primary Contact. This water use, which entails the risk of ingesting appreciable quantities of water, requires a more restrictive bacterial standard than needed for the general secondary contact use. The proposed limit is identical to the existing standard and consistant with the NTAC recommendations. The standard applies during the recreational season of April 1, through October 31.

Section 205: Public and Food Processing Water Supply. This section establishes requirements for waters which are used for public water supplies or as supplies used in the processing of food intended for human consumption.

Section 205 (a) contains a general requirement that all water supplies be of such quality that conventional types of water treatment processes will produce a high quality finished water for drinking. The purpose of this regulation is to ensure control of pollution at its source rather than through the use of extraordinary techniques to remove contaminants prior to use.

This regulation, which was requested by the Federal Environmental Protection Agency, is being considered in separate hearings # 71-11.

Section 205 (b) and (c) lists numerical limits for various contaminants which are based on toxicity toward humans, effects on palatability, aesthetics and interference with water treatment processes. The standards are, with one exception, identical with the mandatory and recommended limits of the Public Health Service Drinking Water Standards - 1962 and the chemical quality requirements listed in the Public Health Service Manual for Evaluating Public Drinking Water Supplies - 1969. The exception is the limit for fluoride for which the Public Health Service established a range of acceptable levels from 1.2 mg/l to 1.8 mg/l and which is represented by a single value of 1.4 mg/l in the proposal. The proposal is consistant with existing standards for public water supply use except for chlorides and sulfates which have been raised from 150 mg/l and 200 mg/l respectively to 250 mg/l in the proposal.

Section 206: Restricted Use Waters. There are a limited number of waterways in the state which, because of their physical nature (channelized canals) and their primary use as industrial and commercial waterways, are unsuited for the maintenance of aquatic life. However, because these waterways are tributary to stream sectors which do provide aquatic life habitat, standards for those waters for toxic substances and other contaminants which are not biodegradable must be maintained at levels compatible with that use. For this reason, in the proposal waters which are not themselves suitable for aquatic life would meet all general criteria with the exception of four criteria which represent parameters which can be biologically or physically degraded. Dissolved oxygen shall be maintained at 3.0 mg/l for sixteen hours in any day with no value less than 2.0 mg/l. Oxygen levels must be kept above zero to prevent nuisance odor conditions from developing. Ammonia nitrogen shall not exceed 2.5 mg/l which is, interestingly, the existing standard for most waters. The proposed ammonia limit would prevent its nitrification from imposing a significant oxygen demand on down-stream sectors. The five-day biochemical oxygen demand (BOD_5) shall not exceed 10.0 mg/l in these waters. There is no existing limit on BOD_5 and the proposed limit should maintain the proposed dissolved oxygen standard. In all other respects, restricted use waters will meet the general criteria.

Section 207: High Quality Waters. Just as some of the State's waters are unsuited to aquatic life because of their present uses, there are in Illinois some streams which require special protection if they are to be maintained in or restored to near pristine quality. The criteria shown in this section are what might be expected of a stream which has had little or no urbanization or industrialization on its banks and, indeed, the provision of the highest available levels of waste treatment on existing sources and the prohibition of further development is the only way to maintain a handful of the State's streams in a near natural state.

Section 208: Lake Michigan Waters. As is the case with other high quality waters, Lake Michigan is unique and deserving of special protection. The proposed levels for ammonia nitrogen, chloride, sulfate and total dissolved solids are the existing values for those constituents. However, where existing standards permit degradation over time, the present proposal is based upon a policy of non-degradation and is therefore a commitment to reducing inputs of these materials to a minimum.

Section 209: Underground Waters. This section, for the first time, extends the regulatory protection of water quality standards to the State's underground waters. The General and Public Food Processing Water Supply criteria are specified because underground waters often feed into surface waters and are widely used for public water supply purposes.

Section 210: Nondegradation. This section ensures that waters will not be lowered in quality, even if no standard is violated, because of less than adequate treatment of a waste discharge. It is essentially the same as the existing standard.

Part III: Water Use Designations

This part identifies which criteria in addition to the general criteria must be met by the designated waters. The designations are based upon present uses and those uses for which the designated waters can reasonably be upgraded.

Section 301: Restricted Use Waters. Under this section of the proposal, portions of the inland waterway system of the Chicago Metropolitan Area would be given less restrictive requirements for four criteria associated with maintaining high levels of aquatic life. The designated waters do not physically provide acceptable habitat for a well rounded fish population. All other waters in the State are tentatively designated for aquatic life. As compared with existing regulations this designation results in the sector of the Illinois River from Joliet to Ottawa being added to those waters in which aquatic life is to be protected.

Section 302: Primary Contact Use. This proposed section exempts Restricted Use Waters and three other Chicago Area streams from the requirement for the whole body contact recreation use. It is the nature of these streams and their industrial and navigation uses that they are unlikely to be intentionally used for swimming. All other waters in the State are tentatively designated for primary contact (whole body contact) use. The proposal extends this use to large number of streams not included in present regulations.

Section 303: Public and Food Processing Water Supply. The proposed water use designation would protect all but a number of Chicago Area streams for this use. Existing regulations specify that the standard be met only at the point of intake itself. The proposed regulation would designate the entire stream or lake as having to meet these criteria. This affords an additional measure of protection to the water supply.

Section 304: High Quality Waters. This section contains a tentative list of streams which are being considered for special protection. The list was developed, in part, with the assistance of the Department of Conservation.

Part IV: Effluent Criteria.

This part contains the restrictions on the concentrations of various contaminants which can be discharged to Illinois waters.

Section 401: General Requirements. (a) This section prohibits dilution of effluents as an alternative to treatment. (b) This section requires that all effluents be treated to remove floating, visible and odor causing contaminants. (c) This section restricts an effluent discharge, alone or in combination with others from causing a violation of any water quality criteria. This means that even if every waste discharge on a stream sector is in compliance with the effluent standards if the number or density of discharges is so great that the water quality criteria are not attained, then additional restrictions will be imposed.

Section 402: Numerical Criteria. This section is the heart of the proposed water pollution control regulations. Specific limits on various contaminants measured at the discharge pipe provide the only acceptable means of enforcing an abatement program. Although stream water quality standards are important indicators of the overall success or failure of the pollution control program, only the measureable and legally enforceable control of wastes at their source can result in meaningful improvement. The joint federal-state program establishing water quality standards has not met with notable success primarily because of its failure to focus on effluent requirements. Illinois must, therefore, move beyond the mandatory requirements of the present federal legislation and, utilizing the provisions of the State's 1970 Environmental Protection Act, establish effluent criteria which will provide adequate protection to the State's waters.

Section 402 (a) - This section continues December 31, 1973 as the final deadline for secondary waste treatment statewide except for the Ohio River for which dates are being considered in separate hearings R 71-3. Secondary treatment is the minimum acceptable level of treatment in existing regulations as well as in the proposal. Wastes discharged to Lake Michigan and to waters designated as high quality waters would be required to provide advanced waste treatment. In addition, all discharges to a stream whose dilution ratio of low flow to effluent is less than five must provide some type of waste treatment beyond secondary. This is changed from existing regulations which permit a waste discharge located where the stream flow to effluent ratio is as low as two to one to provide only secondary treatment. As in existing regulations dilution ratios of less than one to one require advanced waste treatment.

December 31, 1974 is established as the final compliance date for tertiary and advanced waste treatment except for systems serving more than one million persons which are given until December 31, 1976. Waste sources which are presently required to provide treatment beyond secondary by July 31, 1972 must meet that deadline.

To ensure that a series of waste outfalls does not negate the concept of dilution of oxygen demanding effluents by allowing dilution with unassimulated effluents, the proposal would require an assessment of the biochemical oxygen demand level to be expected in the stream after mixing occurs.

Section 402 (b) - This section requires all discharges of bacteria containing wastes to practice year around disinfection. More intensive disinfection is required during the recreational season for effluents discharged to waters designated for primary contact. The proposal is consistant with present regulations.

Section 402 (c), (d), and (e) -The proposed effluent limits contained in these sections are being considered in a separate regulatory proceeding R 70-8, and are included here to show how they might fit into the revised water pollution regulations format. The Board also has before it a proposed effluent standard for temperature of 5° F. above natural temperature covering discharges to the Mississippi River (R 70-16).

Section 402 (f) - This proposal would continue the ban on cyanide discharges contained in SWB-5.

Section 402 (g) - This regulation is being considered in separate hearings, R 71-9.

Section 403: Prohibition of New Sources (High Quality Waters). This part of the proposal would prohibit new sources of effluents into waters designated as High Quality Waters.

Section 404: Background Concentrations. This section is an attempt to deal with the problem that arises when a water source contains a contaminant in excess of the effluent standards. This section would permit the return of such water to a surface source provided the discharge has added no additional quantity of the contaminant. Underground water could be discharged to surface waters provided no violation of a water quality standard resulted.

Part V: Monitoring and Reporting.

This part establishes general requirements for monitoring and reporting information concerning waste discharges.

Section 501: Reporting Requirements. Those who discharge wastes to the waters of the State should be required to provide an accounting of the quantity and quality of those wastes. This section requires reports containing such information to be submitted to the Agency on a routine basis. The proposal is consistent with the existing regulation SWB-6. Special requirements for mercury use reporting were established by the adoption of the Mercury Regulations R 70-5 on March 31, 1971.

Section 502: Effluent Measurement. Wastes discharged from pipes beneath the water's surface which do not have facilities for sampling cannot be tested for effluent criteria before mixing and dilution takes place. This section insures that the Agency can obtain effluent samples for enforcement purposes in such cases. Present regulations do not contain this provision.

Part VI: Performance Criteria.

Section 601: Storage Facilities. The accidental oil spill or toxic material discharge is a constant threat to aquatic life, water supplies and recreational water uses. Enforceable prevention is the best policy. Simple catchment basins or dikes could prevent most spills. This section would make their installation mandatory. Present regulations require installation on existing facilities only after pollution has occurred.

Section 602: Combined Sewers and Effluent Bypasses. This section prohibits the construction of new combined sewers unless retention and treatment is provided to prevent the discharge of

raw sewage. Existing overflows and bypasses are to be afforded interim treatment and disinfection by July 31, 1972. Complete correction of the problem is required by December 31, 1974 for most communities and by December 31, 1976 for the very large ones.

Section 603: Intake Structures. The purpose of this section is to minimize the physical damage to aquatic organisms caused by withdrawing and using large volumes of water such as for cooling purposes. During periods of low flow a large percentage of a stream may be diverted through industrial process or cooling facilities. The proposal attempts to limit damage to aquatic life by insuring that the major part of any river's flow is not so diverted at any time.

Section 604: Prohibition of New Connections. This section adopts as an enforceable regulation a policy enunciated in several Board opinions on specific cases and in use by the Agency in permit procedures. An overloaded treatment plant cannot handle the waste it is already receiving and therefore should not be subjected to additional loads. The result is often the same as discharging the additional waste totally untreated to the receiving waters.

Part VII: Sewer Discharge Criteria.

This part sets certain limits on waste discharges into sewers.

Section 701: General Requirements. This section sets standards on materials which might be harmful to sewers, sewage works, or treatment processes. It would be expected that each municipality or sanitary district would adopt more specific limits on various constituents discharged to its system so that it might in turn more easily meet the effluent standards imposed by the State. At present, the State of Illinois has numerical limits on only two contaminants that apply to discharges to sewers. Those are mercury and cyanide which have been included in the proposal without change.

Section 702: Mercury. This section was adopted by the Board on March 31, 1971.

Section 703: Permit for Discharge of Cyanide to Sewer System. This proposal is basically the regulation existing in SWB-5 and would permit the discharge of limited amounts of cyanide to sewer systems with a permit by the Agency.

Part VIII: Disposal of Wastes from Water Craft.

Section 801: Marine Toilets. This section is a modification of an existing regulation (SWB-19) which prohibits the discharge of sewage from watercraft. The major difference between the proposal and the existing regulation is the requirement that watercraft equipped with a galley or sleeping facilities must have a marine toilet and an acceptable pollution control device.

Section 802: Disposal Facilities. This section is intended to ensure that pumpout facilities are made available to the owners of holding tanks. In addition, the standardization of fittings for pumpout equipment statewide should aid public acceptance of the regulation.

Section 803: Contaminated Bilge or Ballast Water. This section prohibits the discharge of contaminated bilge or ballast waters which constitutes another source of pollution from watercraft. All discharges must meet the effluent standards in Part IV.

Section 804: Proof of Compliance. This section proposed pursuant to section 48 (a) of the Environmental Protection Act would prevent the issuance of a certificate of number to any watercraft not in compliance with the provisions of section 801.

Part IX: Permits.

This part establishes the guidelines under which the Agency may issue waste discharge permits and sets standards for the approval of federal permits.

Section 901: Sewers, Sewage Works, and Waste Discharges. The Environmental Protection Act of 1970 requires a permit from the Agency for the construction, installation or operation of "...any equipment, facility, vessel, or aircraft capable of causing or contributing to water pollution, or designed to prevent water pollution, of any type designated by Board regulations...". The proposal would require all new waste sources to meet four requirements before a permit could be issued by the Agency.

The first and most important requirement would be compliance with all of the Board's pollution control rules or possession of a specific variance from these rules granted by the Board. If a new source

would require additional controls to meet a future requirement of the rules, an acceptable Project Completion Schedule submitted pursuant to section 1002 would be required prior to the issuance of a permit.

In addition, a new source would have to conform to the latest design criteria of the Agency and prove that no degradation in violation of the requirements of section 210 would occur as a result of the issuance of the permit.

Existing waste sources would have until December 31, 1971 to obtain a permit. Existing sources would have to meet the same requirements as new sources with the exception of those pertaining to design criteria and nondegradation.

Permits would be issued for two years and could be modified to comply with any new regulation adopted during that period.

Section 902: Approval of Federal Permits. The federal government is embarking upon a permit program for waste discharges to navigable waters which, if properly implemented, will complement the Illinois program and allow the State to move ahead with its clean up program without the fear of applying unequal competitive pressures on its own municipalities and industry. The federal permit program requires the approval of each permit by a state pollution control agency which, in Illinois, is the Environmental Protection Agency. The proposal would require compliance with all of the rules of the Board before approval could be given for any permit, and may therefore preclude State participation in any "interim" permit procedures which would be less restrictive than those of the State itself.

Part X: Implementation Plan.

Existing water pollution control regulations contain detailed schedules for the installation of certain waste treatment facilities. This part of the proposal continues these existing timetables in effect and establishes a means of monitoring the progress toward meeting the new deadlines for the additional requirements included in the revised regulations.

Section 1001: Waste Discharge Report. This section requires the Environmental Protection Agency to prepare an annual report which will identify the known waste discharges in the State. The report will also describe the action being taken to bring the discharges into compliance. A report that gathers into a single

document information concerning all waste sources in the State will provide valuable information to help the Agency, the Board and the Institute to develop the State's enforcement strategies and provide the public with an important tool with which to gauge the progress and effectiveness of the State's environmental protection program.

Section 1002: Project Completion Schedule. The State of Illinois cannot afford to wait until a polluter has failed to meet a final deadline which may be several years away, before it can move against those who engage in dilatory tactics in the hope of winning additional time for compliance. Interim requirements designed to ensure that work toward pollution abatement is moving forward are necessary. A failure to meet an interim deadline itself constitutes a violation of the regulations and is cause for an enforcement proceeding.

The proposal would require the owner of a source of wastes requiring additional controls to meet any future compliance deadline to submit a Project Completion Schedule within six months. Approval by the Agency of the Project Completion Schedule and progress toward meeting the compliance deadline would provide a defense against an enforcement action with regard to the contaminants being brought under control by the program. The proposal contains a series of interim dates for projects of varying size and complexity.

Section 1003: Final Compliance Dates - Intrastate Waters. The proposed regulations no longer provide for different standards based upon the fact that a stream or lake happens to cross a state line. All the waters of the State are entitled to the same levels of protection based upon their use, not upon political boundaries. Similarly waters leaving the State must be of the same high quality that we demand of those that flow here from other places. However, because certain existing deadlines and compliance schedules are based upon the distinction between interstate and intrastate waters and because any attempt to modify these schedules would probably result in delay in abatement they are maintained intact in the proposal by reference to the existing regulation.

Section 1004: Final Compliance Dates - Interstate Waters. This section repeats the specific treatment requirements and compliance schedules contained in existing regulations. These requirements are in addition to, not in lieu of, any other requirement of the proposal.

PROPOSED WATER QUALITY STANDARDS REVISIONS - #R71-14

CHAPTER IV: WATER POLLUTION

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ILLINOIS POLLUTION CONTROL BOARD
RULES AND REGULATIONS

(Published May 12, 1971, for hearing purposes only. Not adopted by the Board. Comments invited.)

CHAPTER IV: WATER POLLUTION

PART I: INTRODUCTION

101 Authority.

Pursuant to the authority contained in Section 13 of the Environmental Protection Act which authorizes the Board to issue regulations "to restore, maintain, and enhance the purity of the waters of this State in order to protect health, welfare, property, and the quality of life, and to assure that no contaminants are discharged into the waters without being given the degree of treatment or control necessary to prevent pollution", and to adopt water quality standards, effluent standards, standards for the issuance of permits, standards for the certification of sewage works operators, standards relating to water pollution episodes or emergencies, and requirements for the inspection of pollution sources and for monitoring the aquatic environment, the Board adopts the following rules and regulations:

102 Policy.

The General Assembly has found that water pollution "constitutes a menace to public health and welfare, creates public nuisances, is harmful to wildlife, fish, and aquatic life, impairs domestic, agricultural, industrial, recreational, and other legitimate beneficial uses of water, depresses property values, and offends the senses." It is the purpose of these rules and regulations to designate the uses for which the various waters of the State shall be maintained and protected; to prescribe the water quality criteria required to sustain the designated uses; to establish effluent standards to limit the contaminants discharged to the waters; and to prescribe additional regulations necessary for implementing, achieving and maintaining the prescribed water quality. These regulations were developed in close cooperation with the Federal Environmental Protection Agency in order that, consistent with Illinois law, they may also serve the purposes of the Federal Water Pollution Control Act.

103 Repeals.

These rules and regulations replace and supersede Rules and Regulations SWB-1, SWB-5 through SWB-15, and SWB-19, adopted by the Illinois Sanitary Water Board and continued in effect by Section 49 (c) of the Environmental Protection Act "until repealed, amended, or superseded by regulations under this Act."

Accordingly Rules and Regulations SWB-1, SWB-5 through SWB-15, and SWB-19 are hereby repealed, except that any proceeding arising from any act committed before the effective date of the applicable provision of this Chapter shall be governed by the above listed regulations.

104 Definitions. As used in this Chapter, the following terms shall have the meanings specified:

"Act" means the Environmental Protection Act;

"Agency" means the Illinois Environmental Protection Agency;

"Agricultural Wastes" means any water carried solid, liquid, or gaseous wastes resulting from any agricultural process or operation;

"Aquatic Life" means any water use devoted to the maintenance of native populations of fish and other aquatic life;

"Basin" means the entire area encompassed by the watershed boundary for a particular lake or river system and includes all waters within that area whether or not such waters are, in fact, tributary to the designated lake or river;

"Board" means the Pollution Control Board;

"Combined Sewer" means a sewer receiving both surface runoff and sewage;

"Dilution Ratio (R)" means the ratio of the 7 day once in 10 year low flow of the receiving stream to the maximum design flow of the sewage works;

"Effluent" means treated or untreated sewage, industrial and agricultural waste water, cooling water, or other wastes which are discharged directly or indirectly to the waters of the State;

"High Quality Waters" means certain designated waters which require special protection to preserve unique qualities;

"Industrial Wastes" means any water carried solid, liquid or gaseous wastes resulting from any industrial or manufacturing process or operation or from the development or use of any natural resource;

"Institute" means the Illinois Institute for Environmental Quality;

"Interstate Waters" are all waters which cross or form part of the border between Illinois and other states;

"Intrastate Waters" are all the waters of Illinois which are not interstate waters;

"Marina" means any dock or basin which provides mooring, fuel, supply, or related facilities for watercraft;

"Marine Toilet" means any toilet on or within any watercraft;

"Person" means any individual, partnership, co-partnership, firm, company, corporation, association, joint stock company, trust, estate, political subdivision, state agency, or any other legal entity, or their legal representative, agent or assigns;

"Population Equivalent (P.E.)" means the approximate amount of oxygen demanding wastes produced by an adult human expressed in pounds per day of five-day biochemical oxygen demand (BOD_5). One population equivalent is equal to .17 pounds per day of five-day biochemical oxygen demand;

"Primary Contact" means any recreational or other water use in which there is prolonged and intimate contact with the water involving considerable risk of ingesting water in quantities sufficient to pose a significant health hazard, such as swimming and water skiing;

"Public and Food Processing Water Supply" means any water use in which water is withdrawn from surface waters of the State for human consumption or for processing of food products intended for human consumption;

"Restricted Use" means certain designated waters which are not protected for aquatic life;

"Secondary Contact" means any recreational or other water use in which contact with the water is either incidental or accidental and in which the probability of ingesting appreciable quantities of water is minimal,such as fishing, commercial and recreational boating and any limited contact incident to shoreline activity;

"Sewage" means water carried human and human related wastes from any source together with such ground, surface, storm, or other water as may be present;

"Sewage Works" means individually or collectively those constructions or devices used for collecting, pumping, treating, and disposing of sewage, industrial and agricultural wastes or other wastes or for the recovery of by-products from such wastes;

"Sewer" means a pipe or conduit for carrying sewage, industrial waste or other waste liquids;

"STORET" means the national water quality data system of the Federal Environmental Protection Agency;

"Underground Waters" means any waters of the State located beneath the surface of the earth;

"Watercraft" means every type of boat, ship or barge used or capable of being used as a means of transportation on water;

"Waters" means all accumulations of water, surface and underground, natural, and artificial, public and private, or parts thereof, which are wholly or partially within, flow through, or border upon the State of Illinois, except that sewers are not included except as specifically mentioned.

105 Analytical Testing.

All methods of sample collection, preservation, and analysis used in applying any of the rules and regulations in this Chapter shall be in accord with those prescribed in "Standard Methods for the Examination of Water and Waste Water", Thirteenth Edition or with other generally accepted procedures.

PART II: WATER QUALITY CRITERIA

This part of the rules and regulations concerning water pollution describes the water quality criteria which must be met to maintain the specified beneficial uses. References to STORET numbers identify the specific parameter as defined in the STORET system Handbook published by the Federal Environmental Protection Agency.

201 Mixing Zones.

(a) In the application of any of the rules and regulations in this Chapter, wherever a water quality criterion is more restrictive than its corresponding effluent criterion then an opportunity shall be allowed for the mixture of an effluent with its receiving waters. Water quality criteria must be met at every point outside of the mixing zone. Except as otherwise herein provided, the mixing zone shall extend no farther in any direction from an effluent discharge than 600 feet. Single sources of effluents which have more than one outfall shall be limited to a single mixing zone measured from a single point.

(b) In addition to the above, for waters designated for aquatic life (General Criteria), the mixing zone shall include no more than one fourth of the cross sectional area of any river or stream nor shall it at any time extend to more than one half of the surface of any river or stream sector. The mixing zone shall not under any conditions of streamflow, wind or current intersect any area of any lake, river, stream or impoundment in such a manner that the maintenance of aquatic life in the body of water as a whole would be adversely affected.

202 Stream Flows.

The water quality criteria contained in this part shall apply at all times except during periods when flows are less than the average minimum seven day low flow which occurs once in ten years.

203 General Criteria.

The General Criteria listed below will protect the State's water for aquatic life, agricultural use, secondary contact use, and most industrial uses, and ensure the aesthetic quality of the State's aquatic environment. Except as otherwise provided herein, all waters of the State shall meet the following criteria at all times:

(a) Freedom from unnatural sludge or bottom deposits, floating debris, visible oil, odor, unnatural plant or algal growth, unnatural color or turbidity, or matter in concentrations or combinations toxic or harmful to human, animal, plant or aquatic life of other than natural origin.

(b) pH (STORET number - 00400) shall be within the range of 6.5 to 9.0 except for natural causes.

(c) Phosphorus (STORET number - 00665):

(1) Phosphorus as P shall not exceed 0.1 mg/l in any flowing stream.

(2) Phosphorus as P shall not exceed 0.05 mg/l in any stream at the point it enters any reservoir or lake.

(d) Total algae (STORET number - 60050) shall not exceed 500 per ml. at any time in any stream or lake except for natural causes.

(e) Dissolved oxygen (STORET number - 00300) shall not be less than 6.0 mg/l during at least 16 hours of any 24 hour period, nor less than 5.0 mg/l at any time.

(f) Radioactivity:

(1) Gross beta (STORET number - 03501) concentration shall not exceed 100 pico curies per liter (pc/l).

(2) Concentrations of radium 226 (STORET number - 09501) and strontium - 90 (STORET number - 13501) shall not exceed 1 and 2 pico curies per liter respectively.

(g) The following levels of chemical constituents shall not be exceeded at any time:

CONSTITUENT	STORET NUMBER	CONCENTRATION (mg/l)
Ammonia Nitrogen	00610	1.0
*Arsenic (Dissolved)	01000	1.0
Barium (Dissolved)	01005	5.0
Biochemical Oxygen Demand (5-day)	00310	7.0
Boron (Dissolved)	01020	1.0
*Cadmium (Dissolved)	01025	0.05
*Chromium (Dissolved)	01030	0.05
*Copper (Dissolved)	01040	0.02
*Cyanide	00720	0.01

CONSTITUENT	STORET NUMBER	CONCENTRATION (mg/l)
Fluoride	00950	1.4
Iron (Dissolved)	01046	1.0
*Lead (Dissolved)	01049	0.1
Manganese (Dissolved)	01055	1.0
*Mercury (Total)	71900	0.0005 (R 70-5 adopted March 31, 1971)
*Nickel (Dissolved)	01065	1.0
Phenols	32730	0.1
*Selenium (Dissolved)	01145	2.0
*Silver (Dissolved)	01075	0.005
*Zinc (Dissolved)	01090	1.0

*Toxic Substances

(h) The total concentration of all toxic substances indicated by an asterisk (*) in paragraph(g)of this section shall not exceed 2.0 mg/l;

(i) Based on a minimum of five samples taken over not more than a 30-day period, fecal coliforms (STORET number-31616) shall not exceed a geometric mean of 1,000 per 100 ml, nor shall more than 10% of the samples during any 30-day period exceed 2,000 per 100 ml.

(j) The following levels of pesticides shall not be exceeded at any time:

CONSTITUENT	STORET NUMBER	CONCENTRATION (ug/l)
Abate		150
Aldrin		0.3
Allethrin		1.9
Ametryne		340
Aquathol		26
Aramite		3.5
Atrazine		1,260
Azide, potassium		140
Azide, sodium		98
Azodrin		700
Baygon		2.5
Baytex		8.0
Benzene hexachloride (lindane)		1.8
Bidrin		800
Carbaryl (sevin)		150
Carbophenothion (thiodone)		22
Chlordane		1.0

CONSTITUENT	STORET NUMBER	CONCENTRATION (ug/l)
Chlorobenzilate		71
Copper chloride		110
Copper sulfate		15
Cryolite		4,700
DDD (TDE)		0.9
DDT		0.2
Delnav (dioxathion)		1.4
Delmeton (systex)		8.1
Diazinon		3.0
Dibrom (naled)		7.8
Dichlobenil		2,000
2,4-D, PGBEE		96
2,4-D, BEE		210
2,4-D, isopropyl		80
2,4-D, butyl ester		130
2,4-D, butyl + isopropyl ester		150
2,4,5-T isooctyl ester		1,670
2,4,5-T isopropyl ester		170
2,4,5-T PGBE		56
2(2,4-DP) BEE		110
Dead-X		940
DEF		3.6
Dexon		2,300
Dichlone		4.8
Difolitan		3.1
Dieldrin		0.3
Dilan		1.6
Dimethoate (cygon)		960
Dimethrin		70
Dichlorvos (DDVP)		70
Dinitrocresol		21
Diquat		1,230
Disulfoten (di-syston)		4.0
Diuron		430
Dursban		2.0
Du-ter		3.3
Dyrene		1.5
Endosulfan (thiodan)		0.1
Endothal, copper		29
Endothal, dimethylamine		115
Endrin		0.02
EPH		1.7
Ethion		23
Fenac, acid		1,650
Fenac, sodium		750
Guthion		1.0
Heptachlor		0.9

CONSTITUENT	STORET NUMBER	CONCENTRATION (ug/1)
Hydram (molinate)		29
Hydrothol 191		69
Kelthane (dicofel)		10
Kepone		3.8
Lanstan (korax)		10
LFN		7.9
Malathion		2.0
Methoxychlor		0.7
Methyl parathion		800
Morestan		9.6
Ovex		70
Paradichlorobenzene		88
Parathion		4.7
Perthane		0.7
Phosdrin		1.7
Phosphamidon		800
Propazine		780
Pyrethrins		5.4
Rotenone		2.2
Silvex, PGBEE		65
Silvex, isoctyl		140
Silvex, BEE		120
Simazine		500
Sodium arsenite		3,650
Strobane		0.2
Tetradifon (tedion)		110
Tordon (picloram)		250
TEPP		39
Thimet		0.6
Trifuralin		1.1
Toxaphene		0.3
Trichlorofon (dipterex)		16
Vernam (vernolate)		590
Zectran		800

(k) Any substance toxic to aquatic life shall not exceed one-tenth of the 48-hour median tolerance limit (48-hr. TLm) for fresh water organisms.

(l) Temperature (STORET numbers (F°) 00011 and (C°) 00010) (Mississippi River, Wabash and Ohio River temperature standards in this rule are those proposed and to be determined in separate hearings R70-16 and R 71-12.

(1) There shall be no abnormal temperature changes that may affect aquatic life unless caused by natural conditions.

(2) The normal daily and seasonal temperature fluctuations that existed before the addition of heat due to other than natural causes shall be maintained.

(3) The maximum temperature rise at any time or place above natural temperatures shall not exceed 5° F. (2.8° C.) In addition, the water temperature shall not exceed the maximum limits indicated in the following table except for natural causes:

		JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
Mississippi River (Wisc. Border to Alton Lock and Dam)	(°F)	45°	45°	57°	68°	78°	85°	86°	86°	85°	75°	65°	52°
	(°C)	7°	7°	14°	20°	26°	29°	30°	30°	29°	23°	18°	11°
Mississippi River (So. of Alton Lock & Dam)	(°F)	50°	50°	60°	70°	80°	87°	89°	89°	87°	78°	70°	57°
	(°C)	10°	10°	16°	21°	27°	31°	32°	32°	31°	26°	21°	14°
Ohio River	(°F)	50°	50°	60°	70°	80°	87°	89°	89°	87°	78°	70°	57°
	(°C)	10°	10°	16°	21°	27°	31°	32°	32°	31°	26°	21°	14°
All other waters except for Lake Michigan (see 208 (d) and restricted use waters (see 206 (d)	(°F)	50°	50°	60°	70°	80°	90°	90°	90°	90°	78°	70°	57°
	(°C)	10°	10°	16°	21°	27°	32°	32°	32°	32°	26°	21°	14°

204 Primary Contact.

In addition to the General Criteria, waters designated in Part III of this Chapter for primary contact use shall meet the following criteria during the recreational season of April 1, through October 31.

Based on a minimum of five samples taken over not more than a 30-day period, fecal coliforms (STORET number - 31616) shall not exceed a geometric mean of 200 per 100 ml, nor shall more than 10% of the total samples during any 30-day period exceed 400 per 100 ml.

205 Public and Food Processing Water Supply.

In addition to the General Criteria, waters designated in Part III of this chapter for public and food processing water supply shall meet the following criteria at all times:

(a) Waters shall be of such quality that with treatment consisting of coagulation, sedimentation, filtration, storage and chlorination, or other equivalent treatment processes, the treated water shall meet in all respects both the mandatory and recommended requirements of the Public Health Service Drinking Water Standards - 1962. (This section being considered in separate hearings R 71-11).

(b) The following levels of chemical constituents shall not be exceeded:

CONSTITUENT	STORET NUMBER	CONCENTRATION (mg/l)
Arsenic (Dissolved)	01000	0.01
Barium (Dissolved)	01005	1.0
Boron (Dissolved)	01020	1.0
Cadmium (Dissolved)	01025	0.01
Carbon Chloroform Extract (CCE)	32005	0.2
Chloride	00940	250.0
Chromium (Dissolved)	01030	0.05
Copper (Dissolved)	01040	1.0
Cyanide	00720	0.01
Fluoride	00950	1.4
Iron (Dissolved)	01046	0.3
Lead (Dissolved)	01049	0.05
Manganese (Dissolved)	01055	0.05
Mercury (Total)	71900	0.0005 (R 70-5, adopted March 31, 1971)
Methylene Blue Active Substance (MBAS)	38260	0.5
Nitrates plus Nitrites as N	00630	10.0
Oil (Hexane-Solubles)	00550	0.1
Phenols	32730	0.001
Selenium (Dissolved)	01145	0.01
Silver (Dissolved)	01075	0.05
Sulfate	00945	250.0
Total Solids (Dissolved)	00515	500.0
Zinc	01090	5.0

(c) The following levels of pesticides shall not be exceeded:

CONSTITUENT	STORET NUMBER	CONCENTRATION (ug/l)
Aldrin	39330	17
Chlordane	39350	3
DDT	39370	42
Dieldrin	39380	17
Endrin	39390	1
Heptachlor	39410	18
Heptachlor Epoxide	39420	18
Lindane	NA	56
Methoxychlor	39480	35
Organic phosphates plus carbamates	NA	100
Toxaphene	39400	5
2,4-D plus 2,4,5-T, plus 2,4,5-TP	NA	100

206 Restricted Use Waters.

Waters designated in Part III of this Chapter for Restricted Use shall meet the General Criteria with the following exceptions:

(a) Dissolved oxygen (STORET number - 00300) shall not be less than 3.0 mg/l during at least 16 hours in any 24-hour period, nor less than 2.0 mg/l at any time.

(b) Ammonia nitrogen (STORET number-00610) shall not exceed 2.5 mg/l.

(c) Five-day biochemical oxygen demand (STORET number - 00310) shall not exceed 10.0 mg/l.

(d) Temperature (STORET numbers -(°F) 00011 and (°C) 00010) shall not exceed 93°F. (34°C.) at any time except for natural causes.

207 High Quality Waters.

Waters designated in Part III of this Chapter as High Quality Waters shall meet the following criteria in addition to the General Criteria.

(a) Dissolved oxygen (STORET number-00300) shall not be less than 90% of saturation except for natural causes.

(b) Based on a minimum of five samples taken over not more than a 30-day period, fecal coliforms (STORET number - 31616) shall not exceed a geometric mean of 20 per 100 ml.

208 Lake Michigan Waters.

The Waters of Lake Michigan shall meet the following criteria in addition to the General Criteria and Public and Food Processing Water Supply Criteria:

(a) Dissolved oxygen (STORET number-00300) shall not be less than 90% of saturation at any time except due to natural causes.

(b) The following levels of chemical constituents shall not be exceeded at any time:

CONSTITUENT	STORET NUMBER	CONCENTRATION (mg/l)	
Ammonia Nitrogen	00610	0.02	
Biochemical Oxygen Demand (five-day)	00310	1.0	
Chloride	00540	9.0	
Sulfate	00945	20.0	
Phosphorus	00665	0.007	(approved Jan. 6 1971 R 70-6)
Total Solids (Dissolved)	00515	170.0	

(c) Based on a minimum of five samples taken over not more than a 30-day period, fecal coliforms (STORET number - 31616) shall not exceed a geometric mean of 20 per 100 ml.

(d) Temperature (STORET numbers - (°F) 00011 and (°C) 00010):

To be determined in separate hearings #R 70-2. Proposed final draft published April 28, 1971.

209 Underground Waters.

The underground waters of Illinois shall meet the General and Public and Food Processing Water Supply criteria except due to natural causes.

210 Nondegradation.

Waters whose existing quality is better than the established standards at the date of their adoption will be maintained in their present high quality. Such waters will not be lowered in quality unless and until it is affirmatively demonstrated that such change will not interfere with or become injurious to any appropriate beneficial uses made of, or presently possible in such waters and that such change is justifiable as a result of necessary economic or social development.

PART III: WATER USE DESIGNATIONS

This part of the rules and regulations concerning water pollution designates the water uses for which particular waters of the State are to be protected. Waters designated for specific uses must meet the most restrictive criteria listed in Part II of this Chapter for any specified use, in addition to meeting the General Criteria.

301 Restricted Use Waters.

The following are designated as restricted use waters:

(a) Chicago Sanitary and Ship Canal

(b) Calumet Sag Channel

(c) The Little Calumet River from its junction with the Grand Calumet River to the Calumet Sag Channel

(d) Grand Calumet River

(e) Calumet River

302 Primary Contact Use.

All of the waters of Illinois are designated for primary contact use except Restricted Use Waters and the following:

(a) The Chicago River and its branches

(b) Little Calumet River

(c) North Shore Channel

303 Public and Food Processing Water Supply.

All of the waters of Illinois are designated for Public and Food Processing Water Supply use except those designated as Restricted Use Waters and the following:

(a) The Chicago River and its branches

(b) Little Calumet River

(c) North Shore Channel

304 High Quality Waters.

The following waters are designated as high quality waters:

Lusk Creek (Ohio River Basin)

Big Sandy Creek (Illinois River Basin)

Apple River (Jo Daviess County)

Shoal Creek (Kaskaskia River Basin)

Kishwaukee River (Rock River Basin)

Little Wabash River (Ohio River Basin)

Cache River (Ohio River Basin)

LaMoine River (Illinois River Basin)

Big Grande Pierre Creek (Ohio River Basin)

Big Creek (Ohio River Basin)

Clear Creek (Mississippi River Basin)

Kickapoo Creek (McLean & Logan Counties)

McKee Creek (Illinois River Basin)

Nippersink Creek (Fox River Basin)

Galena River (Mississippi River Basin)

Leaf River (Rock River Basin)

Big Bureau Creek (Illinois River Basin)

Pine Creek (Rock River Basin)

Cedar Creek (Stephenson County)

Indian Creek (LaSalle County)

Sugar Creek (Logan and McLean Counties)

Middle Fork Vermilion River (Ford, Champaign, and Vermilion Counties)

PART IV: EFFLUENT CRITERIA

This part of the rules and regulations concerning water pollution prescribes the maximum concentrations of various contaminants which may be discharged to the waters of the State.

401 General Requirements.

(a) Dilution of effluents shall not be an acceptable alternative to treatment. Where water which contains any contaminant in concentrations or quantities which would not require treatment to meet the effluent criteria contained herein is added to a stream of waste water and cannot be reasonably separated, then its quantity shall be measured and concentration of each such contaminant in the combined waste stream shall be recomputed to exclude the diluting effect. The concentrations of contaminants so computed shall be used in determining whether the effluent criteria are being met. (This section is being considered in separate hearings R 70-8).

(b) In addition to the numerical effluent criteria contained in Section 402 of this Chapter, no effluent which contains settleable solids, floating debris, visible oil, odor producing substances, or which has color or turbidity which differs visibly from the receiving waters shall be discharged to any waters of Illinois.

(c) No effluent which contains any substance which, alone or in combination with other sources causes a violation of any water quality criterion contained in Part II of this Chapter shall be discharged to any waters of Illinois.

402 Numerical Criteria.

Except for unavoidable combined sewer overflows during the interim period before their complete elimination, all effluents discharged to the waters of Illinois shall meet the following criteria:

(a) Five-Day Biochemical Oxygen Demand (STORET Number - 00310) and Suspended Solids (STORET Number - 00530):

(1) All deoxygenating wastes and wastes containing suspended solids shall be given at least secondary treatment before discharge to the waters of Illinois in accordance with the timetable contained in Part X of this Chapter, but in no case later than December 31, 1973. The use of sewage works yielding 85% to 90% reduction of five-day biochemical oxygen demand (BOD_5) and suspended solids and providing an

effluent with no more than 30 mg/l of BOD_5 and 37 mg/l of suspended solids will be restricted to those whose untreated waste load is less than 10,000 population equivalents (PE). Sewage works whose untreated waste load is 10,000 PE or greater must provide at least 90% BOD_5 and suspended solids reduction and provide an effluent with no more than 20 mg/l of BOD_5 and 25 mg/l of suspended solids. (Note: Secondary treatment dates for the Ohio River are being considered in separate hearings R 71-3).

(2) No effluent discharged to the waters of this State within the Lake Michigan Basin or to waters designated as High Quality Waters in Part III of this Chapter shall contain more than 4 mg/l of BOD_5 and 5 mg/l of suspended solids after December 31, 1974.

(3) Levels of treatment for oxygen demanding wastes and suspended solids higher than secondary will be required for discharges to the waters of the State in addition to those listed in paragraph (2) of this section as specified in this paragraph. These levels of treatment will be provided in accordance with the schedules contained in Part X of this Chapter, but no later than December 31, 1974, except that any sanitary district, county or municipal sewer system or sewage works serving a population greater than one million persons shall provide such treatment by December 31, 1976. Effluent limits requiring higher than secondary treatment must be met whenever required by any of the following tests:

(i) The dilution ratios in the following table:

Dilution Ratio (R)= Stream Flow (7 day once in 10 year low flow) / Maximum Design Effluent Flow	Maximum Untreated Waste Load Restriction (P.E.)	Minimum Required BOD_5 Reduction (%)	Maximum Effluent BOD_5 (mg/l)	Maximum Effluent Suspended Solids (mg/l)
		(NOTE: Each of these three requirements must be met at all times).		
R > 5	10,000	85	30	37
R > 5	None	90	20	25
R > 1 ≤ 5	None	None Specified	10	12
R ≤ 1 & all discharges to Lake Michigan or to "High Quality" waters	None	None Specified	4	5

;or (ii) The information required to be submitted under paragraph (4) of this section ; or

(iii) A detailed stream simulation modeling study which describes the effect of the waste source in question and all others on the receiving waters and which indicates the levels of treatment necessary to ensure the attainment of water quality standards.

(4) Any person who desires a permit to discharge oxygen demanding wastes to the waters of Illinois in accordance with the provisions of Part IX of this Chapter shall provide a professional engineering estimate to show that after complete mixing with the receiving waters the waste discharge shall not cause a violation of any water quality criteria for five-day biochemical oxygen demand (BOD_5) in Part II of this Chapter during periods of stream flow greater than the average minimum seven day once in ten year low flow. The estimate shall be based upon the best available information concerning the present and expected BOD_5 of the receiving waters and of the effluent and their respective flows. The applicant may base his estimate of the BOD_5 in the receiving waters (C_a below) on the assumption that all upstream discharges will be in compliance with the effluent criteria of this Chapter. The average concentration after mixing may be computed by using the following formula:

$$C_B = \frac{(C_a \times Q_a) + (C_e \times Q_e)}{Q_a + Q_e}$$

where:

C_B = the average concentration of BOD_5 below the waste discharge after complete mixing.

C_a = the concentration of BOD_5 in the stream above the waste discharge.

C_e = the concentration of BOD_5 in the effluent.

Q_a = the flow of the stream above the waste discharge.

Q_e = the effluent flow.

(b) Bacteria:

(1) Effluent disinfection shall be provided at all times to reduce fecal coliforms (STORET number 31616) to 2,000 per 100 ml or less before discharge to any waters of Illinois;

(2) Effluents discharged to waters designated for primary contact in Part III of this Chapter shall contain no more than 400 fecal coliforms per 100 ml during the recreational season of April 1, through October 31;

(Note: Except where noted, proposals contained in subsections c, d, and e are being considered in separate hearings R 70-8.)

(c) (1) The following levels of chemical constituents shall not be exceeded at any time in any effluent discharged to the waters of Illinois:

CONSTITUENT	STORET NUMBER	DATE OF COMPLIANCE FOR CONCENTRATIONS (mg/l) SHOWN	
		July 1, 1971	July 1, 1972
*Arsenic (Dissolved)	01000	1.0	0.05
*Barium (Dissolved)	01005	5.0	1.0
Boron (Dissolved)	01020		1.0
*Cadmium (Dissolved)	01025	0.05	0.01
Chloride	00940		250.0
*Chromium-Trivalent (Dissolved)	01033	1.0	
*Chromium-Hexavalent (Dissolved)	01032	0.05	
*Copper (Dissolved)	01040	0.1	0.04
Cyanide	00720	0.025	
Fluoride	00950		1.0
*Iron (Total)	01045	10.0	
*Iron (Dissolved)	01046		0.3
*Lead (Dissolved)	01049	0.1	0.05
*Manganese (Dissolved)	01055	0.05	
*Mercury (Total)	71900	0.0005	(effective date April 25, 1971-R70-5)
*Nickel (Dissolved)	01065	2.0	
Oil (Hexane-Solubles)	00550	15.0	10.0
pH	00400	range 6 to 10	range 6 to 9
Phenols	32730	0.2	0.1
*Selenium (Dissolved)	01145	0.01	
*Silver (Dissolved)	01075	0.05	
Total Solids (Dissolved)	00515	750.0	
*Zinc (Dissolved)	01090	1.0	

*HEAVY METALS

(2) The total concentration of all dissolved heavy metals in any effluent shall not exceed 2.0 mg/l after July 1, 1972.

(d) Phosphorus (STORET number-00665):

(1) No waste discharge within the Lake Michigan Basin shall contain more than 1.0 mg/l of phosphorus as P after December 31, 1971. (#R70-6 Approved January 6, 1971).

(2) No effluent from any sewage works in the Fox River Basin which receives influent equal to or greater than 2,500 population equivalents or which discharges .25 million gallons per day or more of effluent shall contain more than 1.0 mg/l of phosphorus as P after December 31, 1973.

(3) No effluent from any sewage works in Illinois, except those which discharge directly into the Mississippi, Ohio, or Wabash Rivers, which receives influent equal to or greater than 50,000 population equivalents or which discharges 5 million gallons per day or more of effluent shall contain more than 1.0 mg/l of phosphorus as P after December 31, 1973.

(e) Nitrogen:

(1) Ammonia Nitrogen as N-No effluent from any sewage works in Illinois, except those which discharge directly into the Mississippi, Ohio or Wabash Rivers, which receives influent equal to or greater than 50,000 population equivalents or which discharges 5 million gallons per day or more of effluent shall contain more than 2.5 mg/l of ammonia nitrogen as N after December 31, 1973.

(2) Nitrates plus Nitrites as N-
No waste discharge to any waters of Illinois which has been determined to have a dilution ratio (R) of less than two (2) and which has been designated for public water supply use shall contain more than 10 mg/l of nitrates plus nitrites as N after December 31, 1973. The dilution ratio (R) shall be computed by dividing the 7 day once in 10 year low flow of the receiving stream by the maximum design flow of the sewage works.

(3) Total Nitrogen (NH_3-N+Organic N+NO_2-N+NO_3-N) -
No waste discharge to the waters of Illinois shall contain more than 20 mg/l of total nitrogen as N after December 31, 1973.

(f) Cyanide (STORET number-00720):

No effluent shall contain cyanide in detectable quantities. (Note: This regulation is the essence of the existing SWB-5 cyanide regulation and is offered as an alternative to the 0.025 mg/l limit being considered in R 70-8 and contained in the table in paragraph (c) of this section.)

(g) The gross beta-gamma radioactivity of liquid effluents from any boiling water reactor to the plant discharge canal shall not exceed an annual average 100 pc/l plus the background radioactivity. (Note: This regulation is being considered in separate hearings R 71-9.)

403 Prohibition of New Sources (High Quality Waters).

No source of waste effluents not in existence as of December 31, 1971 shall be permitted to discharge to waters designated as High Quality Waters.

404 Background Concentrations.

(a) Surface sources--Where water taken from a surface water supply contains any contaminant in excess of the effluent criteria contained herein then that water may be returned to that source provided that no increase in the concentrations of any such contaminant has occurred.

(b) Underground water sources--Where water taken from an underground supply contains any contaminant in excess of the effluent criteria contained herein then that water may be discharged to the waters of Illinois provided that no violation of any water quality criteria in Part II results and provided that no increase in the concentration of any such contaminant has occurred.

PART V: MONITORING AND REPORTING

This part of the rules and regulations concerning water pollution prescribes requirements for monitoring, reporting and measuring contaminant discharges.

501 Reporting Requirements.

(a) Every operator of a sewer system or sewage works in the State of Illinois shall submit an operating report to the Agency at a frequency to be determined by the Agency. The report will contain information regarding the strength and quantity of influent and of effluent discharged and of wastes bypassed and combined sewer overflows and the concentration or level of any physical, chemical, bacteriological and radiological parameters for which effluent criteria have been established in Part IV of this Chapter as required by the Agency and any reasonable additional information the Agency may require.

(b) Every person within this State who utilizes mercury or any of its compounds in excess of 15 pounds per year as Hg, or who discharges mercury or its compounds into waters of the State or into any sewer system, shall file with the Agency, on or before June 1, 1971 and annually thereafter, a report setting forth the nature of the enterprise; a list, by type and by quantity of mercury products and mercury derivatives produced, used in, and incidental to its processes, including by-products and waste products; the estimated concentrations and annual total number of pounds of mercury that will be discharged into the waters of the State or that will be dischared into any sewer system; and what measures are taken or proposed to be taken to reduce or to eliminate such discharges. (R 70-5 adopted March 31, 1971).

502 Effluent Measurement.

In order to facilitate the ability of the Agency to conduct its inspecting and investigating responsibilities as described in Section 4 (d) of the Act, all effluent discharge sewers, pipes or outfalls will be designed or modified so that a sample of the effluent can be obtained at a point after the final treatment process and before discharge to or mixing with any waters of the State.. All sewage works shall include such devices for taking samples and for measuring and recording effluent flow as the Agency may require.

PART VI: PERFORMANCE CRITERIA

This part contains specific requirements and prohibitions concerning existing and potential sources of water pollution.

601 Storage Facilities.

(a) Storage facilities for oil, gases, fuels or any other chemical substance capable of causing water pollution if accidentally discharged shall be designed to prevent any spillage which might result in water pollution. Catchment areas, relief vessels, entrapment dikes or other engineering methods shall be utilized at all such facilities by December 31, 1972.

(b) Any person engaged in manufacture or other process, including deactivation of processes, in which cyanides or cyanogen compounds are used or stored shall have every location where such materials are used and stored, so constructed that no such material can escape directly or indirectly to any sewer system or waters of Illinois.

602 Combined Sewers and Effluent Bypasses.

(a) The installation of new combined sewers is prohibited except where sufficient retention or treatment capacity is provided to insure that no violation of the effluent criteria of this Chapter occurs.

(b) All combined sewer overflows and effluent bypasses shall be provided with screening and/or sedimentation and disinfection by July 31, 1972.

(c) All combined sewer overflows and effluent bypasses shall be eliminated or treated to meet the effluent criteria of this Chapter by December 31, 1974 except that any sanitary district or municipal sewer system serving a population of greater than one million persons shall meet this requirement by December 31, 1976.

603 Intake Structures.

(a) Water intake structures shall be designed to prevent harm to fish and to minimize the damage to other aquatic organisms.

(b) No water intake shall withdraw more than one fourth of the flow of any river or stream in Illinois at any time nor shall more than one half of the flow of any river or stream be withdrawn by more than one intake in any ten miles of its length.

604 Prohibition of New Connections.

No person shall connect or permit the connection of any new waste source or increase the volume or concentration of any existing discharge to any sewer system tributary to a sewage works which is in violation of any rule or regulation of this Chapter or whose effluent fails to meet the effluent criteria of this Chapter.

PART VII: SEWER DISCHARGE CRITERIA

This part of the rules and regulations concerning water pollution places certain restrictions on the types, concentrations and quantities of contaminants which can be discharged into sewer systems in the State.

701 General Requirements.

Any wastes discharged to any sewer owned by any municipality, any county, or any sanitary district in the State of Illinois shall meet the following criteria in addition to any established by the municipality, county, or sanitary district itself:

(a) liquids, solids, or gases which by reason of their nature or quantity may cause fire or explosion or be injurious in any other way to sewers, sewage works structures or to the operation of the sewage works are prohibited;

(b) solid or viscous wastes which cause obstruction to the flow in sewers or other interference with the proper operation of any sewer or sewage works are prohibited.

702 Mercury (STORET number - 71900) (R 70-5 adopted March 31, 1971).

(a) No effluent to any public sewer system shall include mercury or any of its compounds in excess of 0.0005 mg/l as Hg at any time.

(b) The discharge of mercury shall be exempt from the limitations of paragraph (a) of this section if it meets all the following conditions:

(i) The total plant discharge totals less than five pounds as Hg in any year;

(ii) The discharge is to a public sewer served by a sewage treatment facility handling no less than 25,000 population equivalents;

(iii) The discharge does not alone, or in conjunction with other sources, cause the effluent from the sewage treatment plant to exceed 0.0005 mg/l as Hg; and

(iv) At least 95% of the mercury that would be discharged in the absence of control is removed from the effluent by December 1, 1971;

(v) After June 1, 1974 the exemptions provided in this subsection (b) shall terminate.

(c) The discharge of wastes from medicinal or therapeutic use of mercury, exclusive of laboratory use, shall be exempt from the limitations of paragraphs (a) and (b) of this section if all the following conditions are met:

(i) The total plant discharge is less than one half pound as Hg in any year;

(ii) The discharge is to a public sewer system; and

(iii) The discharge does not, alone or in conjunction with other sources, cause the effluent from the sewer system or treatment plant to exceed 0.0005 mg/l as Hg.

(d) No discharge of mercury shall be permitted which, alone or in combination with other sources, causes a violation of the water quality standard of 0.0005 mg/l of Hg.

703 Cyanide (STORET number - 00720).

(a) No waste discharge to any public sewer system shall contain detectable levels of cyanide at any time except as permitted by section 703 (b).

(b) Upon application by a county, municipality or sanitary district and approval by the Agency, limited amounts of cyanide or cyanogen compounds may be permitted to be discharged to a county, municipal, or sanitary district sewer system and sewage works. Such discharges shall not exceed 2.0 mg/l and will be permitted only when the Agency has determined that no violation of the effluent criteria of this Chapter will result from such discharge.

PART VIII: DISPOSAL OF WASTES FROM WATERCRAFT

This part of the rules and regulations concerning water pollution regulates the disposal of wastes from watercraft.

801 Marine Toilets.

(a) Every watercraft equipped with a galley or sleeping facilities shall have a marine toilet by May 1, 1972.

(b) No person owning or operating a watercraft with a marine toilet shall use, or permit the use of, such toilet on the waters of this State, unless the toilet is equipped with facilities that will treat, hold, incinerate or otherwise handle the waste in a manner capable of preventing water pollution as described in paragraphs (c) and (d) of this section.

(c) No person shall dispose of any sewage or waste water accumulated in a holding tank or any other container on a watercraft, in such a manner that the sewage or waste water reaches or may reach the waters of the State, except by pumpout to an operating sewage works which has been approved by the Agency or which operates under a permit issued by the Agency.

(d) Acceptable pollution control devices are:

(1) Holding tanks which retain wastes from marine toilets for proper disposal pursuant to paragraph (c) of this section.

(2) Incinerating devices which will reduce to ash all sewage and toilet wastes produced on the watercraft. The ash from such devices is not to be disposed of in the waters of Illinois.

(3) Any other device determined by the Agency to provide an effluent which meets the effluent criteria of this Chapter.

802 Disposal Facilities.

Every marina or dock that has space for 15 watercraft or more shall provide pumpout facilities for the proper disposal of sewage and waste water from holding tanks in accordance with Section 801 (c) of this Chapter by May 1, 1972. The Agency shall within six months of the adoption of this section

promulgate regulations prescribing uniform dimensions for all fittings on pumpout equipment at all facilities affected by this section.

803 Contaminated Bilge or Ballast Waters.

No bilge or ballast water which fails to meet the effluent criteria of this Chapter shall be discharged to the waters of the State.

804 Proof of Compliance.

After May 1, 1972 the Department of Conservation shall not issue a certificate of number pursuant to the provisions of the Boat Registration and Safety Act to any watercraft unless it complies with the provisions of Section 801 of this chapter. Any person applying for a certificate of number shall submit such proof of compliance as the Department of Conservation may require.

PART IX: PERMITS

This part establishes basic guidelines for the issuance of permits for the construction, modification and operation of sewers, sewage works and waste discharges.

901 Sewers, Sewage Works, and Waste Discharges.

(a) New Waste Sources:

No person shall construct, modify, or operate any new sewer, sewage works or waste discharge in the State of Illinois without a permit issued by the Agency. Permits shall be issued for a period of two years.

An application for a permit shall contain such information regarding the quantity of influent and effluent, the concentration or level of any physical, chemical and bacteriological parameter, and any additional information concerning the design or operation of the waste source that the Agency may require.

The Agency shall only issue a permit for a new sewer, sewage works, or waste discharge when:

(i) it will be in compliance with all the rules and regulations in this Chapter, or has been granted a variance from the applicable rules and regulations under the provisions of Title IX of the Act; and

(ii) if required to meet future compliance deadlines, it is the subject of an acceptable Project Completion Schedule submitted in accordance with section 1002 of this Chapter; and

(iii) it conforms to the design criteria of the Agency; and

(iv) it will not cause degradation in violation of section 210 of this Chapter.

(b) Existing Waste Sources:

No person shall operate any existing sewer, sewage works or waste discharge in the State of Illinois after December 31, 1973 without a permit issued by the Agency. Permits shall be issued for a period of two years.

An application for a permit shall contain such information regarding the quantity of influent and effluent, the concentration or level of any physical, chemical and bacteriological parameter, and any additional information concerning the design or operation of the waste source that the Agency may require.

The Agency shall only issue a permit for an existing sewer, sewage works, or waste discharge when:

(i) it will be in compliance with all of the rules and regulations in this Chapter, or has been granted a variance from the applicable rules and regulations under the provisions of Title IX of the Act; and

(ii) if required to meet future compliance deadlines, it is the subject of an acceptable Project Completion Schedule submitted in accordance with Section 1002 of this Chapter.

(c) Modification of Permit:

Any permit issued by the Agency shall provide that it may be modified to make its provisions compatible with any new regulation adopted by the Board.

902 Approval of Federal Permits.

The Agency shall not approve any waste discharge for the purposes of any federal permit unless that waste discharge is in compliance with all the rules and regulations in this Chapter.

PART X: IMPLEMENTATION PLAN

This part continues the compliance timetable sections of SWB-7 through SWB-15 in effect and establishes an annual waste discharges report to be prepared by the Environmental Protection Agency.

1001 Waste Discharge Report.

The Agency shall annually prepare and submit to the Board a Waste Discharge Report which lists the waste discharges in the State, describes the type, quantity and concentrations of the various contaminants being discharged, and describes the existing and planned treatment controls and the scheduled dates for completion of treatment improvements.

1002 Project Completion Schedule.

Within six months of the adoption of this Chapter any person who owns or operates any sewer, sewage works or waste discharge which requires modification or additional controls to meet any future deadline contained in this Chapter shall file a Project Completion Schedule with the Agency. The Project Completion Schedule shall include a description of the waste source, the contaminants to be controlled, the additional controls or treatment required, and a time schedule for the project's completion which must meet the final deadline contained in this Chapter. The approval of a Project Completion Schedule by the Agency and progress in accordance with the schedule contained therein shall constitute a defense to any enforcement action alleging a violation of Title III of the Act with regard to any contaminant included in the control program. The Project Completion Schedule shall include the dates by which the following interim requirements shall be fulfilled:

(a) Disinfection facilities for sewage works and all interim facilities for combined sewer overflows and effluent bypasses per section 602 (b):

(1) Completion of plans and specifications - 12 months before the final compliance date.

(2) Award of construction contracts - 6 months before final compliance date.

(b) Sewage works projects and final control of combined sewer overflows from sewer systems serving less than 10,000 population equivelents and industrial sewage works projects of any size.

(1) Completion of plans and specifications - 18 months before final compliance date.

(2) Award of construction contracts - 12 months before final compliance.

(c) Sewage works projects and final control of combined sewer overflows from sewer systems serving a population equivalent of 10,000 or greater but less than 500,000:

(1) Completion of plans and specifications - 30 months before final compliance date.

(2) Award of construction contracts - 24 months before final compliance date.

(d) Sewage works projects and final control of combined sewer overflows from sewer systems serving a population equivalent of 500,000 or greater:

(1) Completion of plans and specifications - 60 months before final compliance date.

(2) Award of construction contracts - 54 months before final compliance date.

1003 Final Compliance Dates - Intrastate Waters.

In addition to any other requirements of this Chapter, effluents discharged to the intrastate waters of Illinois shall meet the requirements for five-day biochemical oxygen demand, suspended solids and bacteria contained in SWB-14 by July 31, 1972. Effluents discharged to intrastate waters which are required to meet more restrictive criteria than those contained in SWB-14 because of changes in dilution ratio requirements or because their receiving waters have been designated as High Quality Waters shall provide such treatment by December 31, 1974.

1004 Final Compliance Dates - Interstate Waters.

In addition to any other requirements of this Chapter, the following municipalities, sanitary districts and industries shall provide the designated levels of treatment by the date shown:

MUNICIPALITY, SANITARY DISTRICT OR INDUSTRY	NECESSARY TREATMENT REQUIREMENTS	COMPLIANCE DATE
	LAKE MICHIGAN BASIN	
Lansing	Storm Flow Control & Disinfection	December, 1968
N.S.S.D. - Cary Avenue	Secondary Treatment	July, 1972
N.S.S.D. - Lake Bluff	Secondary Treatment	July, 1972
N.S.S.D. - North Chicago	Expansion	July, 1972
N.S.S.D. - Park Avenue	Secondary Treatment	July, 1972
N.S.S.D. - Ravine Avenue	Secondary Treatment	July, 1972
Great Lakes Naval Training Center	Water Treatment Plant Residue Treatment	July, 1970
Abbott Laboratories	Secondary Treatment	December 31, 1968
U.S. Steel	Improved Settling pH & Iron Control	December, 1968

MUNICIPALITY, SANITARY DISTRICT, OR INDUSTRY	NECESSARY TREATMENT REQUIREMENTS	COMPLIANCE DATE
	ILLINOIS RIVER BASIN	
Beardstown Sanitary District	Secondary Treatment	January 1, 1970
Chillicothe Sanitary District	Secondary Treatment	January 1, 1970
Creve Coeur Sanitary District	Secondary Treatment	July 1, 1973
Depue	Disinfection	November, 1967
East Peoria	Disinfection Secondary Treatment	November, 1967 January 1, 1970
Grafton	Disinfection Secondary Treatment	November, 1967 January 1, 1970
Hardin	Disinfection Secondary Treatment	November, 1967 January 1, 1970
Havana	Disinfection Secondary Treatment	November, 1967 January 1, 1970
Joliet	Secondary Treatment	January 1, 1971
LaSalle	Disinfection Secondary Treatment	November, 1967 January 1, 1971
LaSalle County Home	Disinfection	November, 1967
Lockport	Disinfection Secondary Treatment	November, 1967 January 1, 1971
Marquette Heights	Disinfection Secondary Treatment	November, 1967 January 1, 1971
Marseilles	Disinfection Secondary Treatment	November, 1967 January 1, 1970
Morris	Disinfection Secondary Treatment	November, 1967 January 1, 1971
Ottawa	Disinfection Secondary Treatment	November, 1967 January 1, 1971
Pekin	Disinfection Secondary Treatment	November, 1967 January 1, 1971
Peru	Disinfection Secondary Treatment	November, 1967 January 1, 1971
Rockdale	Disinfection	November, 1967

MUNICIPALITY, SANITARY DISTRICT, OR INDUSTRY	NECESSARY TREATMENT REQUIREMENTS	COMPLIANCE DATE
	ILLINOIS RIVER BASIN (cont)	
Sparland School	Disinfection	November, 1967
Spring Valley	Disinfection Secondary Treatment	November, 1967 January 1, 1971
St. Bede College	Disinfection	July 1, 1969
Starved Rock Park	Disinfection	July 1, 1969
Utica	Disinfection	November, 1967
Amoco Chemical Corp. (Joliet)	Additional Treatment	January 1, 1970
Cowles Chemical Co. (Joliet)	Discharge to municipal sewer system or provide adequate treatment	January 1, 1970
Olin-Kraft	Additional Oil Separators	January, 1970
Olin Mathieson Chem. Corp. (Blockson Works)	Close system	July 1, 1970
Phoenix Mfg. Co. (Joliet)	Additional Settling and Oil Removal	July 1, 1970
Rexall Chemical Co. (Joliet)	Disinfection	July 1, 1969
Stephan Chemical Co. (Joliet)	Secondary Treatment	July 1, 1970
Texaco, Inc. (Lockport)	Secondary Treatment	April 1, 1971
Pure Oil Co. (Lamont)	Secondary Treatment	October 1, 1970
Ruberoid Company (GAF Corp.) (Joliet)	Secondary Treatment	July 1, 1970
American Distilling Co.	BOD Reduction	July, 1971
American Nickeloid Co.	Treatment of waste from metal production and finishing	July, 1970
B.F. Goodrich Chemical Company	BOD reduction	July, 1969
Baird Chemical Co. R.R. Mapleton	Additional BOD Removal	July, 1970

MUNICIPALITY, SANITARY DISTRICT, OR INDUSTRY	NECESSARY TREATMENT REQUIREMENTS	COMPLIANCE DATE
	ILLINOIS RIVER BASIN (cont)	
Carus Chemical Co.	Additional Color & Solids Removal	July, 1969
Caterpillar Tractor Co. (East Peoria)	Secondary Oil Removal	July, 1970
Corn Products Co. (Pekin)	Secondary Treatment	July, 1970
Federal Paper Board Co., Inc. Morris Paperboard Mill	Secondary Treatment	May, 1970
Henry Milk Product	Secondary Treatment	July, 1970
Hooker Chemical Co. Farm Chemicals Division	Close System	December, 1970
National Biscuit Co. Marseilles Carton Plant	Secondary Treatment	July, 1969
National Starch Company (Meridosia)	Secondary Treatment	July, 1969
Standard Brands, Inc. Fleischmann Mfg. Div. (Pekin)	Secondary Treatment	November, 1968
Quaker Oats Company (Pekin)	Secondary Treatment	October, 1968
	WABASH RIVER BASIN	
Danville Sanitary District	Disinfection	July, 1972
Georgetown	Disinfection	July, 1972
Greyville	Disinfection Secondary Treatment	July, 1970 July, 1970
Hoopeston	Disinfection Tertiary Treatment	July, 1972 July, 1972
Hutsonville	Disinfection Secondary Treatment	July, 1970 July, 1970
Mt. Carmel	Disinfection Secondary Treatment	July, 1970 July, 1970
Paris	Disinfection	July, 1972
Rossville	Disinfection Tertiary Treatment	July, 1972 July, 1972

MUNICIPALITY, SANITARY DISTRICT, OR INDUSTRY	NECESSARY TREATMENT REQUIREMENTS	COMPLIANCE DATE
	WABASH RIVER BASIN (cont)	
Tilton	Disinfection	July, 1972
	OHIO RIVER BASIN (R71-3 proposal)	
Cairo	Secondary Treatment	December 31, 1973
Elizabethtown	Secondary Treatment	December 31, 1973
Ft. Massac St. Park	Plant Improvements	July, 1968
Joppa Sanitary District	Secondary Treatment	December 31, 1973
Metropolis	Secondary Treatment	December 31, 1973
Rosiclare	Secondary Treatment	December 31, 1973
Alcoa Fluorspar Mine	Solids Removal	January 1, 1970
Crystal-Minerva Oil Fluorspar Mine	Solids Removal	January 1, 1970
Ozark-Mahoning Fluorspar Mine	Solids Removal	January 1, 1970
	ROCK RIVER BASIN	
Byron	Disinfection Secondary Treatment	November, 1967 January 1, 1970
Dixon	Disinfection	November, 1967
Dixon State School	Disinfection	November, 1967
Erie	Disinfection Secondary Treatment	November, 1967 January 1, 1970
Gem. Suburban, Inc. (Winnebago Co.)	Disinfection	November, 1967
Kershaw Trailer Park	Disinfection	November, 1967
Lee County Nursing Home	Disinfection	November, 1967

MUNICIPALITY, SANITARY DISTRICT, OR INDUSTRY	NECESSARY TREATMENT REQUIREMENTS	COMPLIANCE DATE
	ROCK RIVER BASIN (Cont)	
Medusa Cement (Dixon)	Disinfection	November, 1967
Moline South Slope Plant	Secondary Treatment	January 1, 1971
Prophetstown	Disinfection	November, 1967
Rockton	Disinfection Secondary Treatment	November, 1967 January 1, 1970
Silvis	Disinfection Secondary Treatment	November, 1967 January 1, 1970
South Beloit	Disinfection Secondary Treatment	November, 1967 January 1, 1970
Freeport	Disinfection Secondary Treatment	April, 1969 October, 1969
Orangeville	Disinfection Secondary Treatment	July, 1969 January, 1970
Pecatonica	Disinfection Secondary Treatment	July, 1969 January, 1970
Murman Company	Improved Treatment	January 1, 1970
N.W. Steel & Wire Co.	Additional Oil Recovery	January, 1969
Russel, Birdsall & Ward	Iron & Oil Removal	January, 1969
LaForge Rendering Works	Additional Lagoons	July, 1970
Lugano Cheese (Orangeville)	Aerated Loons	January, 1969
	GALENA RIVER BASIN	
Galena	Disinfection	July, 1971

MUNICIPALITY SANITARY DISTRICT, OR INDUSTRY	NECESSARY TREATMENT REQUIREMENTS	COMPLIANCE DATE
	FOX RIVER BASIN	
Batavia	Disinfection	April, 1969
Hebron	Disinfection	October, 1969
Richmond	Disinfection	October, 1968
St. Joseph Resort	Disinfection	April, 1969
Sheridan	Disinfection	May, 1968
Alba Mfg. Company (Aurora)	Refined Settling	January, 1969
Campana Corp. (Batavia)	Improved Treatment	January, 1969
Hamley	Connect to City Sewer	October, 1967
Howell Company	Metals Removal	January, 1969
Kerber Packing Co.	Reduce BOD	July, 1968
Moline Malleable Iron Co.	Settling Lagoons	January, 1969
	DES PLAINES RIVER BASIN	
Commonwealth Edison 7,8 &9	Disinfection	October, 1968
Commonwealth Edison (Romeoville)	Disinfection	October, 1968
Olin Mathieson	Disinfection Secondary Treatment	December, 1969 July, 1970
	KANKAKEE RIVER BASIN	
Aroma Park	Disinfection Secondary Treatment	December, 1969 July, 1970
Bourbonnais	Tertiary Treatment	June, 1970
Kankakee	Tertiary Treatment	July, 1970
Kankakee River State Park	Disinfection	December, 1968
Kankakee Utility Co.	Disinfection	December, 1969

MUNICIPALITY, SANITARY DISTRICT, OR INDUSTRY	NECESSARY TREATMENT REQUIREMENTS	COMPLIANCE DATE
	KANKAKEE RIVER BASIN (Cont)	
Lorenzo School	Disinfection	December, 1968
Wilmington	Disinfection	December, 1968
Wilmington State Boys School	Disinfection	December, 1968
Carey Mfg.	Disinfection Reduce BOD	December, 1968 July, 1969
Watseka	Disinfection	December, 1968
	MISSISSIPPI RIVER	
Dallas City	Secondary Treatment	January, 1969
East Dubuque	Secondary Treatment	December 31, 1971
East Moline (Waterman)	Disinfection Secondary Treatment	July, 1968 December 31, 1973
Fulton	Secondary Treatment	December 31, 1973
Hamilton	Secondary Treatment	December 31, 1973
Moline (North Plant)	Secondary Treatment	December 31, 1973
Nauvoo	Primary Treatment & Disinfection Secondary Treatment	 January, 1969 December 31, 1973
Rock Island	Disinfection Secondary Treatment	January, 1969 December 31, 1973
Savanna	Secondary Treatment	December 31, 1973
Chicago, Rock Island & Pacific R.R.	Treatment Improvements	January, 1969
International Harvester Corp. (Farmall Works)	Treatment Improvements	January, 1969
Nitrin, Inc.	Treatment Improvements	January, 1969
Alton	Secondary Treatment	December 31, 1973
Chester & Chester State Prison	Secondary Treatment	December 31, 1973

MUNICIPALITY, SANITARY DISTRICT, OR INDUSTRY	NECESSARY TREATMENT REQUIREMENTS	COMPLIANCE DATE
	MISSISSIPPI RIVER (Cont.)	
Columbia	Secondary Treatment	December 31, 1973
Dupo	Secondary Treatment	December 31, 1973
East Alton	Secondary Treatment	December 31, 1973
East St. Louis	Secondary Treatment	December 31, 1973
East Side Levee & Sanitary Dist.		
(Cahokia)	Secondary Treatment	December 31, 1973
(Lansdowne)	Secondary Treatment	December 31, 1973
Ft. Defiance Park	Secondary Treatment	December 31, 1973
Godfrey (Youngblood)	Secondary Treatment	December 31, 1973
Grafton	Secondary Treatment	December 31, 1973
Granite City	Secondary Treatment	December 31, 1973
Hartford	Secondary Treatment	December 31, 1973
Quincy	Secondary Treatment	December 31, 1973
Roxanna	Secondary Treatment	December 31, 1973
Sauget (Monsanto)	Secondary Treatment	December 31, 1973
Wood River	Secondary Treatment	December 31, 1973
Alton Box Board Co.	Secondary Treatment	December 31, 1973
American Oil Co.	Treatment Improvements	December, 1969
National Marine	Treatment Improvements	December 31, 1969
Barge Cleaning Co.	Secondary Treatment	December 31, 1973
Olin Corporation	Additional Treatment	October, 1971
Shell Oil Company	Treatment Improvement	December, 1969
Clark Oil Co.	Treatment Improvement	December, 1969
Swift & Co.	Secondary Treatment	December 31, 1973
Union Tank Car	Treatment Improvements	December, 1968

NOTE: The preceding timetable was taken from SWB-7 through SWB-13. Where those regulations contained dates for the start of required construction the dates were converted to final compliance dates in the following manner:

(1) Disinfection-start construction date + 6 months = final compliance date.

(2) Secondary treatment, BOD & reduction, and all other types of treatment improvements for all industries and for municipalities and sanitary districts of less than 10,000 population-start construction date + 12 months = final compliance date.

(3) Secondary treatment and all other types of treatment improvements for municipalities and sanitary districts of 10,000 or greater population equivalents - start construction date + 24 months = final compliance date.

VILLAGE OF SAUGET

SANITARY DEVELOPMENT AND RESEARCH ASSOCIATION

SAUGET, ILLINOIS 62201

September 27, 1971

MINUTES OF TECHNICAL ADVISORY COMMITTEE
MEETING HELD ON 9-20-71

A meeting was held at 1:00 p.m. on Monday, September 20, 1971 at Monsanto Company by the Technical Advisory Committee. Those members present were Ben Williams, Gene Lewis, Edward Cook, Mike Foresman and Bill Graff. Jerry Jones was also present.

1. The first order of business was to review the status of the Secondary Treatment Study. The progress report dated Sept. 13, 1971 was discussed in detail. Major point of interest are as follows:

   a. Standard Biological Activated Sludge system has been eliminated as an alternate for secondary treatment.

   b. Sulfide treatment process will be intergraded with the clarification step.

   c. Majority of heavy metal will be reduced by Carbon treatment.

   d. Sludge recycle process will be essential for complete usage of lime.

   e. Carbon loss on regeneration will probably average 6-7%.

   f. Sand filters will be required after clarification to prevent plugging of carbon columns.

2. The second order of business was to discuss the future Secondary Treatment work. Areas to be evaluated are as follows:

   a. Determine the Lost Capacity of Darco (alias) Carbon after 1st and 2nd regeneration. Whitco Carbon will also be evaluated for capacity loss due to regeneration.

C311-20

b. Study will be conducted to try and determine the chemical or compound which causes heavy metal removal in the carbon columns.

c. Operational tests will be conducted using a pilot sand filter.

d. A batch unit containing Activated Carbon and Activated Sludge will be evaluated for a two week period.

3. The information collected to date for the Waste Stream Segregation Report was discussed with Jerry Jones. At the present time Alternates IA and IB are the most likely candidates, but until cost data is completed, a complete evaluation cannot be made.

It was agreed that a second TAC meeting would be scheduled during October by the writer. The meeting was then adjourned.

Mike Foresman dy

Mike Foresman

dy

OTHER ADDRESSEES • FOR INFORMATION

CERRO COPPER & BRASS COMPANY
DIVISION OF CERRO CORPORATION

CC: 8841

INTERNAL MEMORANDUM

Form HO-10 SHOW NAME, TITLE AND CORPORATION OF ADDRESSEE AND ADDRESSOR

TO: Jos. W. Goldenberg

DATE: September 20, 1971

FROM: Bill Graff

SUBJECT: Water Pollution Program

The meeting called by Mr. Foresman was held at 1:00 P.M. at Monsanto. In attendance were Mrssrs Foresman and Williams of Monsanto, Mr. Lewis of Edwin Cooper, Mr. Cook of American Metals, Mr. Jones and the writer. Jerry Jones conducted the meeting and explained what experimental work had been done so far. He indicated that most metals would be no problem, but that treatment would have to be made for Cu and Zn being over 2 PPM.

Their tests showed that 6-7% of carbon was lost in regeneration and that further study was necessary. He mentioned also that further investigation was being made on a small sand filtration system.

He presented briefly their proposal for separating process water from clean water flows and plans to meet separately with the several companies to discuss their suggestions.

Bill Graff

BG/as

C311-21

PROGRESS REPORT

WATER POLLUTION ABATEMENT PROGRAM

September 13, 1971

REPORT PRESENTED TO:

THE VILLAGE OF SAUGET BOARD OF TRUSTEES

&

THE SAUGET SANITARY DEVELOPMENT AND RESEARCH ASSOCIATION

Distribution List:

American Metals Climax	2
Cerro Copper and Brass	2
Edwin Cooper	2
Midwest Rubber Reclaiming	2
Mobil Oil	2
Monsanto	6
Village of Sauget	6

BIOLOGICAL SYSTEM

The biosystem was shut down on July 19 because additional nutrients and substrate did not produce a viable biological system.

A combined biological-powdered activated carbon system cannot be justified economically because of high carbon dosages required for color removal. Carbon is not regenerated in this system.

HEAVY METALS

Neutralization System

Results of analysis for various heavy metals have shown that the average zinc levels after lime treatment are well below 1.0 mg/l. American zinc, of course, was not operating during this period. Cu levels ranged generally from 0.05 to 0.25 with the average value well above 0.04 mg/l. Cadmium levels will present no problem it appears.

Sulfide Treatment

A separate sulfide mixing and clarification system was set up after the lime system in the pilot plant and copper levels in the effluent ranged from 0.05 to 0.25 mg/l. Zinc levels were very low -<0.1 mg/l, but the feed coming from the lime step contained only about 0.1 mg/l Zr

Carbon Treatment

The effluent from the carbon columns had a very low copper level - from <0.01 to 0.28 mg/l. Cadmium levels were less than 0.01 mg/l, and zinc less than 0.25 mg/l. These results are being checked again in another column run and set of laboratory analysis.

FUTURE PILOT PLANT WORK

Because of the levels of metals after carbon treatment and the fact that sulfide treatment does not produce an effluent with an acceptable copper level, it would not appear practical to put in another mixing chamber and clarification system for sulfide treatment. Sulfide treatment could either take place in the flocculating basins after lime neutralization with clarification of the neutralized waste occurring after the flocculating basins, or sulfide treatment could follow the clarification and the sulfide precipitate could be removed on the filters.

Filters will be necessary because of the carry over of fine particles and finer precipitates apparently resulting from post precipitation of gypsum. Problems result in the carbon bed with gypsum and we will pilot plant a filter during September.

A sample of exhausted carbon was regenerated and tested and has shown somewhat less capacity for color and COD

removal. We are sending the exhausted carbon back for regeneration and will test it again. If the loss in capacity is significant, we will test other carbons to measure their decrease in capacity after regeneration.

EVALUATION OF ALTERNATIVES FOR HANDLING VILLAGE WASTE WATER DISCHARGES

I - A Primary Treatment for Excess Flow

I - B Secondary Treatment for Excess Flow

II New Process Sewer

III New Storm Sewer

The alternatives listed above have been discussed with representatives of each member of the Sanitary Development and Research Association. Water balances, flow diagrams for sewers and treatment plant schemes, as well as plot plans have been completed. Cost estimates will include both the treatment plant cost as well as an estimate of the costs for inplant modifications for each industry.

FEDERAL FUNDING OF PROJECT

Attached is a copy of an article which appeared in the St. Louis Post Dispatch.

PROJECT SCHEDULE

Pilot plant work should be completed during the early part of October as forecast in our initial proposal.

Water Pollution Termed Unsolved

By a Special Correspondent of the Post-Dispatch

WASHINGTON, April 12 — A panel assembled by Ralph Nader today termed the nation's water pollution control efforts a miserable failure.

The student task force led by the consumer advocate said that despite seven federal laws and 3.5 billion dollars appropriated over the last 15 years, the federal clean water program has alleviated the problem in only a few scattered instances. It has failed to reduce pollution of any single major body of water, the group said.

Continued deterioration of lakes and streams is turning American into a water wasteland, Nader said in a commentary on the findings.

"The Kafkaesque tapestry extends into the mockery of federal enforcement conferences, the never-ending deadline extensions for the weakest of compliance, the secured trade secrecy . . . the loss of livelihoods for thousands of commercial fishermen, and the emergence of water so laden with ignitable wastes that rivers such as the Buffalo and the Cuyahoga (in Cleveland) are declared official fire hazards," Nader said.

Among the findings reported in the task force's 700-page report issued today:

(1) The federal program's most significant shortcoming is its failure to control industrial wastes, currently the cause of four times as much pollution as household sewage and constituting 50 per cent of the burden on the overloaded municipal waste treatment plants.

(2) Drinking water treatment removes few of the most dangerous chemicals dumped into lakes and rivers. Treatment facilities are unable to cope with the more than 500 new chemicals released each year by industry.

(3) State and federal clean water agencies have almost completely disregarded the cause of the largest volume of water pollution, agricultural runoff. Nitrates from fertilizer have reached the danger limit in drinking water in some localities and cancer-causing hormones that have been added to cattle feed are subject to minimal controls.

(4) Despite boasts of huge expenditures, the budgets of even the most generous of corporate polluters allocate no more than seven tenths of 1 per cent of revenue for waste treatment and the national average of all industries is less than one third that figure.

(5) The Office of Management and Budget (formerly the Bureau of the Budget), through its authority to control federal forms and questionnaires, has prevented clean water officials ever from finding out from industries how much pollution, or what type and where, they are dumping.

(6) In 15 years, federal water pollution control authorities have taken only one offender to court. That was the city of St. Joseph, Mo., in 1960. A federal court ordered completion of treatment facilities by 1963, but today 25 per cent of St. Joseph's sewage is still being dumped raw into the Missouri River.

(7) Congress has not had the courage to empower federal authorities, or to require the states, to set effluent standards, limits on the type or quantity of discharges from single sources. Instead, the state agencies are required to set standards of cleanliness for entire bodies of water and then to try to prove that a single polluter's discharges results in violation of the standard.

(8) The Federal Refuse Act of 1899, which forbids dumping waste into any navigable waterway of the United States, was completely unenforced for 70 years. Since it was rediscovered in the books in late 1969, the Government has used it against 30 violators—out of about 40,000.

Other polluters, including National Lead Co. in St. Louis, were shielded by a decision by Attorney General John N. Mitchell not to use the 1899 law, the Nader report charged.

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The Nader task force on water pollution was headed by David R. Zwick, a third-year student at Harvard Law School, and by Marcy Benstock, a recent graduate of Radcliffe College and the New School of Social Research. Their 700-page report compared with the report completed a year ago under the direction of John C. Esposito, a young Washington lawyer.

Assisting in the study were 13 other student volunteers at the Center for the Study of Responsive Law, as Nader's agency is called.

November 11, 1970

Mr. G. L. Bratsch, Chairman
Sauget Sanitary Development & Research Assn.
Sauget, Illinois 62201

Dear Mr. Bratsch:

As we discussed at the September Association meeting, either I or one of our New York personnel will provide a written report in conjunction with the verbal report given to the Association. At the meeting held on November 9 the highlights of the following report were presented and discussed.

Two phases of the site study have been completed:

1) Survey of the industries,
2) Observation of the facilities and operation of the primary treatment plant.

Several phases of the program will be completed as soon as possible now that American Zinc and Midwest Rubber are operating. These phases are:

1) Flow measurement of the individual industries,
2) Analysis of flow proportioned samples,
3) Determination of rate schedule for individual industries discharging to the Village of Sauget Treatment Plant.

There will be additional charges incurred for labor, equipment rental and supervision which were not covered by the fixed cost price of $21,365. These charges will result from the fact that American Zinc's discharges would have been measured, sampled and analyzed along with all the discharges from the outfalls along the North Trunk Sewer and Midwest's discharges along with the other discharges into the South Trunk Sewer. Additional charges however should be less than 15% of the initial charge. An itemized cost for the additional work will be presented to the Association during the month of November.

After the work has been completed at American Zinc and Midwest Rubber, we would like to report our findings for the flow measurement work and the observation of the primary treatment plant. This meeting could possibly be scheduled before the next regular meeting of the Association in January.

C311-23

The studies now in progress include:

1) Laboratory biological batch treatability studies:

   a) Treatment of neutralized effluent from the treatment plant simulating aeration basin with mixed liquor pH control,
   b) Treatment of neutralized effluent from the treatment plant simulating neutralization of the waste before primary sedimentation,
   c) Treatment of synthetic wastes composed of color producing bodies manufactured by Monsanto;

2) Air stripping or aeration experiments to determine effect of aeration without any biological activity;

3) Analytical methods:

   a) Review of analytical methods used at the treatment plant,
   b) Determination of relationship between total organic carbon, biochemical oxygen demand and chemical oxygen demand as indicators of waste strength,
   c) Comparison of colorimetric analytical methods with "Standard Methods for Wastewater Analysis",

4) Check of various industries for discharges of heavy metals.

Studies which will start during the next month will include:

1) Determination of the level of various contaminants in the well water from each industry,

2) Further work with Monsanto Organic Research on ammonia and color removal,

3) Additional neutralization experiments to determine costs and degree of contamination removal for various neutralization systems,

4) Preliminary plans for any additional bench scale work that may be necessary before design of a pilot plant.

11/23/70 Copied W. E. Dunnick
cc P. TANDLER
J. GOLDENBERG
W. GRAFF

Very truly yours,

J. L. Jones

Jerry L. Jones,
Site Engineer Sauget Project
Monsanto Biodize Systems, Inc.

JLJ/ls

#2C/71
1:00PM

FOLKESMAN MONSANTO

WILLIAMS "

COOK

JONES

GRAFF

STEVE LEWIS

CONDUCTED BY J. JONES

1) HEAVY METALS RUN IN PILOT PLANT

CANT MEET Cu

2 PPM TOTAL WILL GIVE PROBLEMS

1-2 PPM POLY ELECTROLYTE FLOCKULENT.

BASED ON 10 YR. AMMORTIZATION

6-7% Carbon loss in regeneration at 1800°

LIME WILL HAVE TO BE RECYCLED.

CARBON REGENERATED AT NEW YORK OR TEXAS.

PILOT PLANT OF SMALL SAND FILTER TO BE SET UP.

WaterBal 1A REVIEWED.

2YR STORM

ALT 2+3 — REQUIRES NEW STORM SEWER

C311-24

Cost

Present — Sump with 12 separate sumps, & pump overhead.

CIERRO 2 000 000 G P Day

630 GPM THROUGH NEW TREATMENT PLANT TO BE INSTALLED AT END OF ROAD NEAR D. CREEK.

MOST SANITARY TO BE DIRECTED TO HIGHWAY 3.

PROGRESS REPORT

WATER POLLUTION ABATEMENT PROGRAM

September 13, 1971

REPORT PRESENTED TO:

THE VILLAGE OF SAUGET BOARD OF TRUSTEES

&

THE SAUGET SANITARY DEVELOPMENT AND RESEARCH ASSOCIATION

Distribution List:

American Metals Climax	2
Cerro Copper and Brass	2
Edwin Cooper	2
Midwest Rubber Reclaiming	2
Mobil Oil	2
Monsanto	6
Village of Sauget	6

BIOLOGICAL SYSTEM

The biosystem was shut down on July 19 because additional nutrients and substrate did not produce a viable biological system.

A combined biological-powdered activated carbon system cannot be justified economically because of high carbon dosages required for color removal. Carbon is not regenerated in this system.

HEAVY METALS

Neutralization System

Results of analysis for various heavy metals have shown that the average zinc levels after lime treatment are well below 1.0 mg/l. American zinc, of course, was not operating during this period. Cu levels ranged generally from 0.05 to 0.25 with the average value well above 0.04 mg/l. Cadmium levels will present no problem it appears.

Sulfide Treatment

A separate sulfide mixing and clarification system was set up after the lime system in the pilot plant and copper levels in the effluent ranged from 0.05 to 0.25 mg/l. Zinc levels were very low -<0.1 mg/l, but the feed coming from the lime step contained only about 0.1 mg/l Zr

Carbon Treatment

The effluent from the carbon columns had a very low copper level - from <0.01 to 0.28 mg/l. Cadmium levels were less than 0.01 mg/l, and zinc less than 0.25 mg/l. These results are being checked again in another column run and set of laboratory analysis.

FUTURE PILOT PLANT WORK

Because of the levels of metals after carbon treatment and the fact that sulfide treatment does not produce an effluent with an acceptable copper level, it would not appear practical to put in another mixing chamber and clarification system for sulfide treatment. Sulfide treatment could either take place in the flocculating basins after lime neutralization with clarification of the neutralized waste occurring after the flocculating basins, or sulfide treatment could follow the clarification and the sulfide precipitate could be removed on the filters.

Filters will be necessary because of the carry over of fine particles and finer precipitates apparently resulting from post precipitation of gypsum. Problems result in the carbon bed with gypsum and we will pilot plant a filter during September.

A sample of exhausted carbon was regenerated and tested and has shown somewhat less capacity for color and COD

removal. We are sending the exhausted carbon back for regeneration and will test it again. If the loss in capacity is significant, we will test other carbons to measure their decrease in capacity after regeneration.

EVALUATION OF ALTERNATIVES FOR HANDLING VILLAGE WASTE WATER DISCHARGES

I - A	Primary Treatment for Excess Flow
I - B	Secondary Treatment for Excess Flow
II	New Process Sewer
III	New Storm Sewer

The alternatives listed above have been discussed with representatives of each member of the Sanitary Development and Research Association. Water balances, flow diagrams for sewers and treatment plant schemes, as well as plot plans have been completed. Cost estimates will include both the treatment plant cost as well as an estimate of the costs for inplant modifications for each industry.

FEDERAL FUNDING OF PROJECT

Attached is a copy of an article which appeared in the St. Louis Post Dispatch.

PROJECT SCHEDULE

Pilot plant work should be completed during the early part of October as forecast in our initial proposal.

Water Pollution Termed Unsolved

By a Special Correspondent of the Post-Dispatch

WASHINGTON, April 12 — A panel assembled by Ralph Nader today termed the nation's water pollution control efforts a lamentable failure.

The student task force led by the consumer advocate said that despite seven federal laws and 3.5 billion dollars appropriated over the last 15 years, the federal clean water program has alleviated the problem in only a few scattered instances. It has failed to reduce pollution of any single major body of water, the group said.

Continued deterioration of lakes and streams is turning American into a water wasteland, Nader said in a commentary on the findings.

"The Kafkaesque tapestry extends into the mockery of federal enforcement conferences, the never-ending deadline extensions for the weakest of compliance, the secured trade secrecy . . . the loss of livelihoods for thousands of commercial fishermen, and the emergence of water so laden with ignitable wastes that rivers such as the Buffalo and the Cuyahoga (in Cleveland) are declared official fire hazards," Nader said.

Among the findings reported in the task force's 700-page report issued today:

(1) The federal program's most significant shortcoming is its failure to control industrial wastes, currently the cause of four times as much pollution as household sewage and constituting 50 per cent of the burden on the overloaded municipal waste treatment plants.

(2) Drinking water treatment removes few of the most dangerous chemicals dumped into lakes and rivers. Treatment facilities are unable to cope with the more than 500 new chemicals released each year by industry.

(3) State and federal clean water agencies have almost completely disregarded the cause of the largest volume of water pollution, agricultural runoff. Nitrates from fertilizer have reached the danger limit in drinking water in some localities and cancer-causing hormones that have been added to cattle feed are subject to minimal controls.

(4) Despite boasts of huge expenditures, the budgets of even the most generous of corporate polluters allocate no more than seven tenths of 1 per cent of revenue for waste treatment and the national average of all industries is less than one third that figure.

(5) The Office of Management and Budget (formerly the Bureau of the Budget), through its authority to control federal forms and questionnaires, has prevented clean water officials ... from finding out from industries how much pollution, or what type and where, they are dumping.

(6) In 15 years, federal water pollution control authorities have taken only one offender to court. That was the city of St. Joseph, Mo., in 1960. A federal court ordered completion of treatment facilities by 1963, but today 25 per cent of St. Joseph's sewage is still being dumped raw into the Missouri River.

(7) Congress has not had the courage to empower federal authorities, or to require the states, to set effluent standards, limits on the type or quantity of discharges from single sources. Instead, the state agencies are required to set standards of cleanliness for entire bodies of water and then to try to prove that a single polluter's discharges results in violation of the standard.

(8) The Federal Refuse Act of 1899, which forbids dumping waste into any navigable waterway of the United States, was completely unenforced for 70 years. Since it was rediscovered in the books in late 1969, the Government has used it against 30 violators—out of about 40,000.

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Bill Lewis

REQUEST FOR LABORATORY TEST

DATE 9/19/70

REQUESTED BY Allsup

CUSTOMER Fedders M. O. NUMBER

SIZE 3/8 x 016 LW TEMPER Lt Anneal ALLOY Cu

CERTIFICATION REQUIRED

CHEMICAL ANALYSIS:

☐ Cu ☐ Sn ☐ Pb ☐ Fe ☐ Ni

☐ P ☐ Zn ☐ S ☐ Bi ☐ Te

☐ OTHER AG

#5 STL

PHYSICAL TESTS REQUIRED:

TEST REQUIRED			SAMPLE NO.		
GRAIN SIZE, mm			Sn =	.003	
ROCKWELL, 15-T			Pb =	.008	
TENSILE, psi			Fe =	.003	
ELONGATION, %			Ni =	.016	
EXPANSION			Zn =	ND	
BEND			Bi =	ND	
			Te =	ND	
			Ag =	.021	
			P =	.035	

SPECIAL REQUEST

U Bends Wouldnt Stay properly

LAB. COMMENTS

BY

C31-27

OTHER ADDRESSEES • FOR INFORMATION

CC: W. Graff
File - Water Pollution Abatement

CERRO COPPER & BRASS COMPANY
DIVISION OF CERRO CORPORATION

INTERNAL MEMORANDUM

Form HQ-10 SHOW NAME, TITLE AND CORPORATION OF ADDRESSEE AND ADDRESSOR

TO: P. Tandler, Technical Manager

DATE: July 14, 1971

FROM: Jos. W. Goldenberg, Chief Engineer

SUBJECT: Biodize Progress Report - 7/12/71

Under project Scope, page 3 of above report, the following statement "a more detailed investigation of impoundment and/or segregation, than was originally planned, will be required" - indicates the necessity for additional work by Biodize.

I personally agree that the alternates listed under Scope be evaluated. However, there have been a number of discussions over the past years relative to all 4 alternates - as well as a report by Horner & Shifrin on sewage segregation. Paul Hodges of Monsanto should be quite conversant with the above - as well as with the work done by Cliff Stutz - formerly with Monsanto, on the subject of impoundment. Undoubtedly, all of this information would be made available to Biodize. There maybe a "little" history and background on the above that I would be happy to contribute.

JWG/as

C311-28

OTHER ADDRESSEES • FOR INFORMATION

CC: J. W. Goldenberg
File 8497

CERRO COPPER & BRASS COMPANY
DIVISION OF **CERRO CORPORATION**

INTERNAL MEMORANDUM

Form HQ–10 SHOW NAME, TITLE AND CORPORATION OF ADDRESSEE AND ADDRESSOR

TO: Paul Tandler

DATE: September 2, 1971

FROM: Bill Graff

SUBJECT: 8/24 Grab Samples

Attached is the results of the analysis of the sewage samples taken over a 24 hour period starting at 4:00 P.M. on 8/24 from 11 of the 12 manholes designated A through M. The sample from Station "F" was destroyed accidently before it was picked up at the end of the period. The Zn and Cu checks were made by our laboratory from a small amount removed from the 1000 cc. accumulated samples. The larger quantites in 1000 cc. plastic bottles were sent to Monsanto Chemical where they were checked for Hg.

Bill Graff

BG/as

C311-29

DATE 8-30-71

SHIFT [illegible]

Mohammed Mustafa

MULTIPLY X 10^{-3} = GR/LITER
SAMPLES TAKEN OVER [illegible]
STARTING 8/24 - 4PM - APPROX
75 cc EACH 2 HRS.

SAMPLE	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT PPM	METHOD OF ANALYSIS	PPM [illegible] REMARKS AS REPORTED BY MONSANTO CHEM
A	Zn	1	130	Atomic Absorption	0,122
B	Zn	1	37	" "	0,160
C	Zn	1	40	" "	0,092
D	Zn	1	48	" "	0,098
E	Zn	1	100	" "	0,0015
G	Zn	1	1	" "	0,0003
H	Zn	1	0.9	" "	LESS THAN .00025
J	Zn	1	1	" "	LESS THAN .00025
K	Zn	1	1.5	" "	0,0007
L	Zn	1	17	" "	0.014
M	Zn	1	13	" "	0.012
A	Cu	1	150	" "	
B	Cu	1	70	" "	
C	Cu	1	30	" "	
D	Cu	1	58	" "	
E	Cu	1	70	" "	
G	Cu	1	4	" "	
H	Cu	1	7	" "	
J	Cu	1	4.9	" "	
K	Cu	1	85	" "	
L	Cu	1	Higher Than >100	" "	NO ADDITIONAL SAMPLE AVAILABLE FOR FURTHER DILUTION
M	Cu	1	14	" "	

DATE 8-30-71

SHIFT 1st - Shift

Multiply X 10^{-3} = GR / LITER

Samples Taken over 2nd Hr
Starting 8/24 - PPM - Approx
75 cc each Runs.

SAMPLE	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT PPM	METHOD OF ANALYSIS	PPM Hg REMARKS As Reported By Personnel
A	Zn	1	130	Atomic Absorption	0.122
B	Zn	1	37	= =	0.160
C	Zn	1	40	= =	0.092
D	Zn	1	48	= =	0.098
E	Zn	1	100	= =	0.0015
G	Zn	1	1	= =	0.0003
H	Zn	1	0.9	= =	Less Than .00025
J	Zn	1	1	= =	Less Than .00025
K	Zn	1	1.5	= =	0.0007
L	Zn	1	17	= =	0.014
M	Zn	1	13	= =	0.012
A	Cu	1	150	= =	
B	Cu	1	70	= =	
C	Cu	1	30	= =	
D	Cu	1	58	= =	
E	Cu	1	70	= =	
G	Cu	1	4	= =	
H	Cu	1	7	= =	
J	Cu	1	4.4	= =	
K	Cu	1	85	= =	
L	Cu	1	Higher than >100	= =	No additional sample available for further dilution
M	Cu	1	14	= =	C311-30

SDMS US EPA REGION V
FORMAT- OVERSIZED - 5
IMAGERY INSERT FORM

The item(s) listed below are not available in SDMS. In order to view original document or document pages, contact the Superfund Records Center.

SITE NAME	**Sauget Area 1**		
DOC ID #	**145421**		
DESCRIPTION OF ITEM(S)	**Map - Sewage System, Village of Sauget - Sqmpling points & flow measuring**		
REASON WHY UNSCANNABLE	**_X_ OVERSIZED**	**OR**	**___ FORMAT**
DATE OF ITEM(S)	**8/04/70**		
NO. OF ITEMS	**1**		
PHASE	**E.6**		
PRP	**Cerro Copper Products**		
PHASE (AR DOCUMENTS ONLY)	**___ Remedial ___ Removal ___ Deletion Docket ___ AR ___ Original ____ Update # ____ Volume ____ of ____**		
O.U.			
LOCATION	**Box # 4 Folder # 3 Subsection _____**		
COMMENT(S)			

Monsanto

Monsanto Biodize Systems Inc.
510 Northern Boulevard
Great Neck, New York 11021
Phone: (516) 466-5511

July 15, 1971

Mr. W. E. Dunnick
Cerro Copper and Brass Company
Sauget, Illinois

Dear Mr. Dunnick:

A recent newsletter (#22) from the Illinois Pollution Control Board has recommended that all storm water discharges be given primary and secondary treatment. This ruling has changed the scope of our work with the Village and all our inplant studies with the various industries considering this change a revised treatment scheme investigation is proposed.

OBJECTIVES

Determine the various streams to be given:

(1) Extensive treatment, i.e. lime and sulfide treatment

(2) Minimal Treatment

(3) No Treatment

(4) Process design for the various treatment schemes which would include:

(a) the removal efficiencies for copper, iron, zinc, cadmium, lead, and any other problem metals.

(b) reagent requirements at optimum efficiency.

BIODIZE
Monsanto
BIODIZE SYSTEMS INC.

C311-33

(c) sludge generation and disposal.

(d) economic comparison of the four schemes shown in Figure #1 with a final estimate for the recommended scheme.

After treatment, depending on the findings for the Village of Sauget sewer survey for a segregated sewer system, some of the above streams will be sent to the Village Treatment Plant and others to the storm clean water sewer. The alternatives have been shown in Figure #1. The flow quantities for the various schemes must be determined from this work.

SCOPE OF WORK

From our two preliminary studies we have found four streams in the plant to contain the majority of the metals contamination. These streams are the discharges from the Slimes area, the #3 Anode Furnace Scrubber, the Maertz Furnace Scrubber and the Pond. The discharge at Dead Creek would not be suitable for discharge without treatment to a clean water system with removal of two of the above mentioned heavily contaminated streams. With this in mind a treatment scheme investigation is proposed to determine:

(1) treatment of the four heavily contaminated streams.

(2) the treatment of the total Dead Creek discharge.

(3) and to conduct a sampling, analysis, and treatment evaluation of various streams contributing to the

Dead Creek flow. From this sampling and analysis program we hope to find streams which are not contaminated.

This investigation would be carried out using two main sampling points in the plant. A dam would have to be placed at the lift station where the pond water flows to assure that all the pond water flows west. The water from the slimes area must be conveyed to the pond discharge line. The waste from the #3 Anode Furnace Scrubber should be conveyed to the Pond. These flows will be sampled at the Administration Building. The other sampling point would be the Dead Creek discharge. Two continuous samplers would be used at these points for 15 days. Continuous samplers would also be set out at various points along the lines discharging to the Dead Creek system. Flow measurement for heavily contaminated streams will be necessary.

Bench scale work employing lime, polyelectrolytes, and possibly sulfide polishing would be done to accomplish the treatment objectives. An eight foot settling column will be used to design the clarifiers.

The sewer definition work proposed under Phase III-B will be performed during this phase (proposal dated April 12, 1971).

Costs for Phases C and D are as stated in the February 22nd proposal; minus as noted in paragraph A; plus additional costs

for the change in scope of the project to allow for investigation of treatment to a level to enable discharge to a clean water system if constructed and identification of such streams. The costs are:

III-C - Investigation of Treatment Schemes

(1)	1 Engineer 12 days @ $200	$2,400
	1 Technician 20 days @ $150	3,000
	Laboratory Charge	300
	Supplies	90
	Subtotal	$5,790
	Flow Definition	350
	TOTAL	$6,140
(2)	Additional Work to Evaluate Possibility of Discharging Certain Streams to a Segregated Clean Water Sewer System	
	Outside Laboratory Fees	$2,000
	Engineering 10 days @ $200	2,000
	Technician 12 days @ $150	1,800
	TOTAL	$5,800

III-D - Economic Comparisons, Preliminary Designs, Estimate and Final Report Preparation

Engineering 13 days @ $200	$2,600
Drafting and Estimating	1,875
Provisions for consultation	450
	$4,925
TOTAL	$16,865

Paragraph A

Phase III-D as originally proposed (February 26, 1971) contained 15 engineering days allotted for report preparation. This time was spent preparing reports for III-A (preliminary sampling and analysis) and for III-B (flow measurement). This will be billed accordingly.

It is proposed that Cerro authorize Phases III-C and III-D as revised at a total cost of $16,865 with the understanding that 15 engineering days will be charged to previous work.

A final report containing design parameters, preliminary design work, and an engineering cost estimate will follow upon completion of the work.

Terms and conditions will continue as previously agreed.

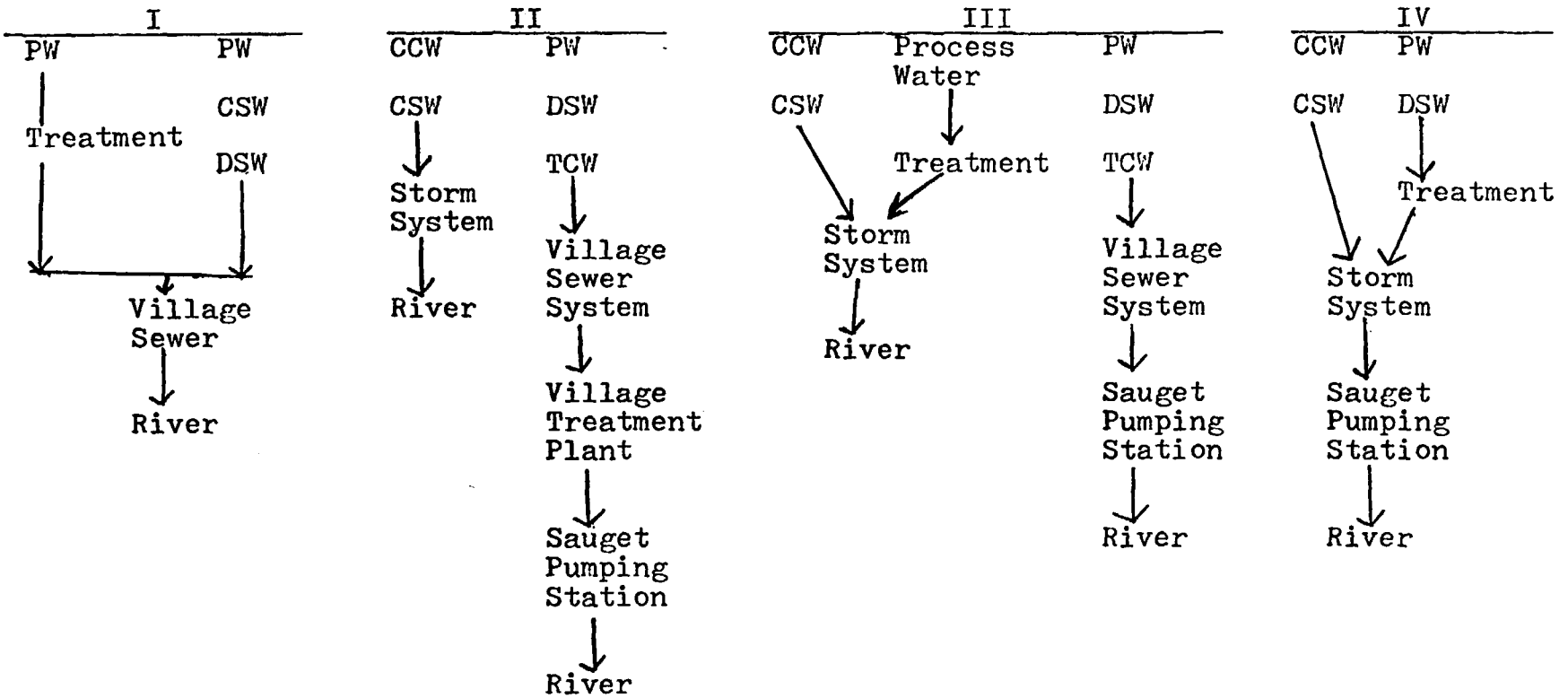
Yours truly,

Bruce C. Davis
Field Service Engineer

Jerry L. Jones
Technical Service Manager

BCD:rs

CERRO COPPER AND BRASS COMPANY



LEGEND

PW - Process Water

CSW - Clean Storm Water

DSW - Dirty Storm Water

CCW - Clean Cooling Water

TCW - Treated Contaminated Water

FIGURE 1

8/24/71

SAMPLES TO BE TAKEN FROM 12 LOCATIONS MARKED ON DWG 1104-G-2,m OVER A 24 HR PERIOD STARTING ON 8/24 APPROX 9PM

TOTAL SAMPLE FROM EACH LOCATION TO BE 1000 cc. MADE UP FROM ABOUT 75 cc SAMPLES TAKEN AT ABOUT 2 HR INTERVALS.

THE SMALL SAMPLING BOTTLE IS 300 cc, BUT WE WILL USE ONLY ABOUT 75 cc ON EACH TRIP.

1) USING THE HAND VACUUM PUMP, WITH THE END OF THE PLASTIC TUBE IN THE PIPE AS INDICATED BY THE ARROWS ON THE DRAWING, FILL THE SMALL SAMPLING BOTTLE
2) REMOVE THE STOPPER, SHAKE THE BOTTLE AND DISCARD THE ENTIRE FIRST FILLING.
3) TAKE A 2ND FILLING OF THE SMALL BOTTLE, SHAKE THE BOTTLE AND POUR ONLY ABOUT 75 cc (ABOUT 3/4 OF AN INCH) INTO THE 1000 cc PLASTIC BOTTLE.

ABOUT 12 SAMPLES FROM EACH LOCATION SHOULD FILL THE 1000 cc BOTTLES.

C311-34

OTHER ADDRESSEES • FOR INFORMATION

CERRO COPPER & BRASS COMPANY
DIVISION OF CERRO CORPORATION

CC: J. W. Goldenberg
File 8497

INTERNAL MEMORANDUM

Form HQ-10 SHOW NAME, TITLE AND CORPORATION OF ADDRESSEE AND ADDRESSOR

TO: Al Suhre

DATE: August 20, 1971

FROM: Bill Graff

SUBJECT: Sewage Sampling

Since the Foundry is not pouring the Anode Furnace on Monday, Tuesday morning would be the best time for starting the 24 hour sampling program I mentioned to you.

I will make up a routing and show the fellow you select how the samples are to be taken. I can show the second shift man also and perhaps you can have him stay over to show the 3rd shift fellow.

BG/as

C311-35

OTHER ADDRESSEES • FOR INFORMATION

CC: W. E. Dunnick
R. O. Wigger
R. E. Conreaux
W. G. Graff
File 8841

CERRO COPPER & BRASS COMPANY

DIVISION OF **CERRO CORPORATION**

INTERNAL MEMORANDUM

Form HQ-10 SHOW NAME, TITLE AND CORPORATION OF ADDRESSEE AND ADDRESSOR

TO: P. Tandler, Technical Manager

DATE: August 17, 1971

FROM: Jos. W. Goldenberg, Chief Engineer

SUBJECT: Village of Sauget, Study of Alternate Waste Water Collection Systems

Ben Sparks, Monsanto Biodize, phoned for an appointment to discuss the above subject as it related to the Cerro plant sewers.

Mr. Sparks was informed that:

1. In the event it proved feasible to provide segregated sewers in the village - i.e. "clean water" suitable for only primary treatment and "contaminated water" requiring secondary treatment.
   a. Cerro could divert contaminated sewage toward the Route 3 municipal sewers, and,
   b. Cerro could divert clean sewage (including a major portion of the storm water runoff) toward Dead Creek.

2. There seemed to be a number of unresolved discrepancies in Biodize's report to Cerro on in-plant flow measurement and analysis (III B).

3. It appeared prudent to either request that this study be repeated, or make sufficient additional analyses to lend some credibility to the results.

4. Cerro has under construction facilities for sludge removal from the air pollution abatement equipment bleed-off. These will materially decrease the amount of suspended solids and heavy metals now entering the sewers.

5. Items 2, 3 and 4 would in all probability not affect the premise in Item 1.

JWG/as

C311-36

8/12/71

		Zn	Hg (ppm)
A	MH 33. FROM WEST	100 PPM	.0002
B	MH 33 FROM POND	6	.0005
C	L.S ON ROAD FROM POND	6	.0007
D	MH 6 FROM WEST	10	.0015
E	MH 6 FROM IRON TANKS	100	.0009
F	MH 3 FROM WEST	8	.0014
G	FROM TUBE MILL LT 2 + BRASS MILL TO D.C.	NIL	LT .0005
H	FROM EXT FLOOR AREA	.7	"
J	FROM TUBE MILL LOW LINE SEWER	NIL	"
K	FROM BLDG 19	1.1	"
L	ADMINISTRATION BLDG	4	"
M	DEAD CREEK EXIT.	3	"

AT L ADMINISTRATION LINE 375 GPM.

@ .0005 ppm = 1.02 gms/day

AT M DEAD CREEK EXIT 1150 GPM

@ .0005 ppm = 3.15 gms/day

4.17 gms/day (TOTAL)

(250cc)

SINGLE GRAB SAMPLES TAKEN 8/5/71
ACIDIFIED & CHECKED FOR ZN 8/6
TAKEN TO MONSANTO CHEM 8/6

C311-37

CERRO COPPER & BRASS COMPANY
DIVISION OF CERRO CORPORATION

ST. LOUIS WORKS
P. O. BOX 681
EAST ST. LOUIS, ILL. 62202
618 337-6000

PURCHASE ORDER

No. [illegible]

THIS NUMBER MUST APPEAR ON ALL INVOICES, LABELS, PACKING LISTS & SHIPPING PAPERS.

APR 8 1971

TO SELLER

[illegible]
[illegible]
GREAT NECK, N.Y. 11021
ATTN: MR. ROBERT COX
(516) [illegible]

SHIP TO:
CERRO COPPER & BRASS COMPANY
HIGHWAY = 3, ALTON & SOUTHERN TRACKS
SAUGET, ILL. 62001

AFE W/OS 113-70 [illegible]
DEPT.

MARK SHIPPING PAPERS
"RECEIVING CLOSES 3 P.M."

DATE OF ORDER	DATE REQUIRED WORK	REQ. NO.	CONFIRMATION DATE	REFER ALL INQUIRIES TO
4-7-71	3/4/71	PT32114		ROBERT W. JOHNSON
TERMS	**F.O.B.**			**SHIPPING INSTRUCTIONS**
W/30 MONTHLY BILLING	DEL.			

PLEASE ENTER OUR ORDER FOR THE FOLLOWING MATERIAL OR SERVICES SUBJECT TO THE TERMS PRINTED ON BOTH SIDES OF THIS ORDER.

QUANTITY	DESCRIPTION	UNIT PRICE	AMOUNT
	TO PERFORM ENGINEERING WORK AND FIELD TESTS DIRECTED TOWARD DEFINING PROCESS DESIGN DETAILS FOR THE PRE-TREATMENT OF WASTE STREAMS OF PLANT.	2075.00	
	PHASE III-A. PLUS "OUT OF POCKET" EXPENSE PER PROPOSAL DATED FEB. 2, 1971. ADDITIONAL WORK OUTLINED IN PROPOSAL DATED 2/20/71 MAY BE AUTHORIZED THROUGH CHANGE ORDERS FOLLOWING REVIEW & DISCUSSION OF WORK-TO-DATE.		
	"CONFIRMATION"		
	FOR: PLANT-WIDE SEWERS WHY: TO DEVELOP DESIGN CRITERIA FOR WASTE TREATMENTS EST: 2075.00 PLUS OUT-OF-POCKET EXPENSES		

YOUR PRICES MUST BE EXCLUSIVE OF ALL TAXES. ANY APPLICABLE TAX WHICH YOU ARE REQUIRED TO COLLECT MUST BE SHOWN AS A SEPARATE ITEM ON ALL QUOTATIONS & INVOICES.

MAIL INVOICE IN DUPLICATE TO
P.O. BOX 681
EAST ST. LOUIS, ILL. 62202

REQUISITIONER

CERRO COPPER & BRASS COMPANY
DIVISION OF CERRO CORPORATION

BY _____
PURCHASING AGENT

C311-38

Monsanto

Monsanto Biodize Systems Inc.
510 Northern Boulevard
Great Neck, New York 11021
Phone: (516) 466-5511

May 12, 1971

Mr. W. E. Dunnick
Cerro Copper and Brass Company
Sauget, Illinois

Dear Mr. Dunnick:

In our proposal dated February 26, 1971, we did not specifically outline the analysis to be performed on your waste streams and we would like to clarify this point.

An acidified composite of the total plant effluent comprised of 24 hourly samples proportioned according to flow will be analyzed for the following substances:

Arsenic	Lead
Barium	Manganese
Boron	Nickel
Chromium (+3)	Selenium
Chromium (+6)	Silver
Copper	Zinc
Cyanide	Mercury
Fluoride	Cadmium

Iron (Total and Dissolved)

A sample of well water will also be analyzed at the

BIODIZE Monsanto

C311-39

same time to give us an indication of the background levels in the ground water.

The samples from the points specified within the plant in the proposal will be analyzed for pH, Zinc, Cadmium, Copper, Iron, and any other metals which show a significant concentration in the total plant composite.

Very truly yours,

Jerry L. Jones

Jerry L. Jones
Prototype Plants Supervisor

JLJ:rs
5/13/71 Copied W. E. Dunnick
cc/ P Taudler
N. Lorenz
R. Wigger
J. Goldenberg
W. Graff

CERRO COPPER & BRASS COMPANY
DIVISION OF **CERRO CORPORATION**

INTERNAL MEMORANDUM

Form HQ-10 SHOW NAME, TITLE AND CORPORATION OF ADDRESSEE AND ADDRESSOR

OTHER ADDRESSEES

CC: P. Tandler
J. W. Goldenberg
File N/BS 113-70

TO: Monsanto Biodize - Bruce Davis

DATE: May 13, 1971

FROM: Bill Graff

SUBJECT: Sampling

We have all the extension cords placed as you requested and ready for your sampling to begin this evening.

Repairs on the Maerz Furnace were finished last evening, and the furnace will be charged this afternoon.

With the lift station at Bldg. 80 and 2 of the Sauget station pumps operating, the level in Dead Creek is down to normal and should permit proper sampling at the various points.

BG/as

C311-40

MONTH OF MAY, 71

TANKHOUSE IRON TANK CUBIC LOSS

DATE	LITERS OF FLOW	GRAMS CUBIC PER LITER	GRAMS OF CUBIC LOST X ~~1000~~	POUNDS LOST
1.	34,232	.050	1712	3.8
2.	88,279	.090	7945	17.5
3.	91,539	.050	4577	10.1
4.	73,965	.006	448	1.0
5. *	72,008	.050	3600	7.9
6.	90,164	.040	3607	7.9
7.	64,184	.038	2439	5.4
8.	51,461	.030	1544	3.4
9.	53,640	.160	8582	18.9
10.	96,412	.040	3857	8.5
11.	103,391	.152	15,715	34.6
12.	134,567	2.08	279,899	346.0
13.	137,996	.006	0828	1.8
14.	59,905	.048	2875	6.3
15.	41,414	.04	1657	3.7
16.	85,477	.028	2393	5.3
17.	191,670	.022	4216	9.3
18.	159,000	.048	7632	16.8
19.	165,572	.048	7948	17.5
20.	126,094	.020	2522	5.6

* ESTIMATE

CONTINUE ON PAGE 2

DATE		LITERS OF FLOW	GRAMS CUBIC PER LITER	GRAMS OF CUBIC LOST X 453.6	POUNDS LOST
21.		102,542	.060	6153	13.6
22.		62,809	.006	377	.8
23.		90,011	.026	2340	5.2
24.		109,130	.014	1528	3.4
25.		128,861	.016	2062	4.5
26.		133,683	.016	2139	4.7
27.		91,234	.022	2007	4.4
28.		66,324	.022	1459	3.2
29.		17,120	.02	342	.8
30.	*	90,909	.03	2727	6.0
31.		19,255	.05	965	2.1

TOTAL POUNDS LOST: 579.4

TANKHOUSE GENERAL FOREMAN: O. Wilkes

*ESTIMATED

C311-42

TIME REPORT

EMPLOYE NO. 01438 5325

BRUCE C. DAVIS

LOCATION: GREAT NECK

PERIOD (Month & Year): April '71

NOTE: Reports approved by Department Heads or other designated persons should be mailed so as to reach the [redacted] Payroll Dept. not later than the morning of the second last working day of the month.

EMPLOYE NO. 01438 5325

LOCATION: GREAT NECK

PERIOD (Month & Year): APRIL '71

Do not use these columns FOR OFFICE USE ONLY

Enter all time in hours and show daily total. Account for days worked, illness, vacation, etc. Cross-foot and balance the daily with the monthly total.

	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	23	26	27	28	29	30	31	TOTAL HRS.	ACCOUNT NO.	JOB NO.	%	AMOUNT
						8				4		8		[illegible]									8	8	X	X	8	8	6	60	SAUGET	0225		
[illegible]	X	X	8	8	8			X	X		8		4		X	X														57	CERRO	0273		
							8																							8	HOLIDAY	0002		
										4			4	4																12	OTHER DEPT.	0003		
														4			8	8	8	8	8	X								44	COLGATE PALMOLIVE KANSAS CITY			
																														176			100%	

EMPLOYE SIGNATURE: Bruce C Davis

APPROVED BY: JLJ

C31-43

TIME REPORT

EMPLOYE NO. 348-38-6034

NOTE: Reports approved by Department Heads or other designated persons should be mailed so as to reach the [redacted] Payroll Dept. not later than the morning of the second last working day of the month.

NAME: Joseph M. Mackin

LOCATION: Bldg 2E 0136 FIELD - SAUGET

PERIOD (Month & Year): April 1971

Report all time in hours and show daily total. Account for days worked, illness, vacation, etc. Cross-foot and balance the daily [illegible]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	TOTAL HRS.	ACCOUNT NO.	JOB NO.	%	AMOUNT
	2	X	X	7	4	4	8		X	X	8	8	3	6		X	X							X	8	8	X	X	6		2	74.		0225		
8	6			1	4	4																						2	8	6	39.	CERRO In Plant	0273		
								8																							8		0002		
													5	2	8			8	8	8	8	8									55	Colgate-Palmolive (Kansas City)			
																															116			100%	

EMPLOYE SIGNATURE: Joseph M. Mackin

APPROVED BY: [illegible]

EMPLOYE NO. 348-38-6034

LOCATION: Bldg 2E 0136 FIELD - SAUGET

PERIOD (Month & Year): April 1971

Do not use these columns FOR OFFICE USE ONLY

MONSANTO BIODIZE 3/5/71

BRUCE DAVIS, JERRY JONES, PAUL, BOB CONRAUX, BOB JOHNSON, BILL LORENZ, JOE GOLDENBERG, BILL GRAFF.

NEXT WEEK - JAMDUNG -

SAMPLING MAR 15 PHASE 3A

DING 1104 G_0 - 2g .04 ppm COPPER.

GET FLOW DIAGRAM FROM CONRAUX

? DISOLVED SOLIDS FROM WELL WATER.

CONTACT AMER ZINC FOR TREATMENT OF WELLS.

C311-44

OTHER ADDRESSEES • FOR INFORMATION

cc: P. Tandler
R. Wigger
File 1104

CERRO COPPER & BRASS COMPANY
DIVISION OF CERRO CORPORATION

INTERNAL MEMORANDUM

Form HQ-10 SHOW NAME, TITLE AND CORPORATION OF ADDRESSEE AND ADDRESSOR

TO: W. E. Dunnick, Vice President DATE: February 25, 1971

FROM: W. P. Lorenz, Laboratory Director

SUBJECT: TRACE IMPURITIES IN OUR WATER SUPPLY

According to your request, we have performed a trace element analysis on our city and deep well water supplies. We have empirically established the limits of detection for the impurities requested to be analyzed. The limits of detection given below are not to be taken as the minimum detection limits, but only as the preliminary values that we were able to achieve with our present technique. However, if necessary, we could probably develop methods to detect these impurities in concentrations a hundred times lower.

element	limit of detection
Iron	0.1 PPM
Lead	0.2 PPM
Zinc	0.02 PPM
Copper	0.03 PPM
Cadmium	0.02 PPM

The samples analyzed were tap water from the lab and well water from the deep well by the northeast corner of Building 80. The results of the analysis are listed below in PPM.

C311-45

element	city water	well water
Iron	LT 0.1	5.5
Lead	LT 0.2	LT 0.2
Zinc	LT 0.02	0.15
Copper	LT 0.03	LT 0.03
Cadmium	LT 0.02	LT 0.02
Chlorine	19	22

Data supplied by the East St. Louis and Interurban Water Company for the year 1965 stated that the Iron and Chlorine concentrations ranged from 0.03 to 0.1 PPM and 15 to 27 PPM, respectively.

W. P. Lowry

WPL:ek

VILLAGE OF SAUGET
WATER POLLUTION ABATEMENT PROGRAM

INDUSTRY QUESTIONAIRE

1. Are there any major changes in production capacity or product mix planned during the next five years? _____

If so, please fill in the information below:

Product	% change in production	Types of Changes to be expected in waste characteristics (raw materials, products, by-products)	Changes in waste water volumes
TUBE	50% INCREASE		
CATHODE	NO CHANGE		

2. What percentage of your present waste water discharge consists of "clean cooling water"? 20%

How was this number calculated? BY ESTIMATING THE PERCENTAGE OF RETURN WATER FROM HEAT QUENCHING OPERATIONS, GAS SCRUBBERS, AND OTHER PROCESSES INVOLVING DIRECT CONTACT OF WATER WITH GOODS OR BY PRODUCTS IN PROCESS. ESTIMATE - 80% *

3. Do you have a capital cost figure available from your own survey work for costs for cooling water segregation or for converting processes to using recirculated

* ALL WATER RETURNED TO PLANT RESERVOIR IS DEEMED TO BE "UNCLEAN" COOLING WATER.

C311-46

INDUSTRY QUESTIONAIRE (continued)

3. (continued)
cooling water? No.

4. How much cooling water do you presently recirculate?

Estimate 3000 GPM

What is the dissolved solids level of this recirculated water? 400 - 600 PPM

(If not a normal cooling tower, specify system and approximate dissolved solids level.) A Number Of Systems Are Tubular Heat Exchangers Using Recirculated City Water and Deionized Water As The Cooling Medium. The Dissolved Solids Levels Are Similar To The Tower Water.

5. Have you ever or do you plan to institute a plant-wide program for informing employees of the problems which can result from dumping or washing down certain compounds into the sewer system?

Have not but will inform supervisors.

VILLAGE OF SAUGET
WATER POLLUTION ABATEMENT PROGRAM

INDUSTRY QUESTIONAIRE

1. Are there any major changes in production capacity or product mix planned during the next five years? _____

If so, please fill in the information below:

Product	% change in production	Types of Changes to be expected in waste characteristics (raw materials, products, by-products)	Changes in waste water volumes
TUBE	50% INCREASE		
CATHODE	NO CHANGE		

X 2. What percentage of your present waste water discharge consists of "clean cooling water"? 10-20%

How was this number calculated? BY ESTIMATING WHAT PERCENT OF TOTAL IS NOT CONTAMINATED BY SCRUBBERS AND QUENCHER TANKS 20%*

X 3. Do you have a capital cost figure available from your own survey work for costs for cooling water segregation or for converting processes to usir; recirculated

* ALL WATER KEPT IN RESERVOIR IS CONSIDERED TO BE "UNCLEAN" COOLING WATER

INDUSTRY QUESTIONAIRE (continued)

3. (continued)
cooling water? No

4. How much cooling water do you presently recirculate?
~~3000~~ GPM 5000

What is the dissolved solids level of this recirculated water? Approx 400 - 600 PPM

(If not a normal cooling tower, specify system and approximate dissolved solids level.) _____

5. Have you ever or do you plan to institute a plant-wide program for informing employees of the problems which can result from dumping or washing down certain compounds into the sewer system?

CERRO COPPER & BRASS COMPANY
ST. LOUIS WORKS

TRANSMITTAL SLIP

- ☐ ELECTROLYTIC
- ☑ ENGINEERING ✓
- ☐ FOUNDRY
- ☐ INDUSTRIAL ENG. J.W.G.
- ☐ LABORATORY
- ☐ LABOR RELATIONS W.G.G.
- ☐ MAIN OFFICE
- ☐ MILL OFFICE
- ☐ SAFETY
- ☐ SECURITY
- ☐ OTHERS
- ☐
- ☐
- ☐
- ☐

ACTION

- ☐ Take Appropriate Action
- ☐ Per Your Request
- ☐ For Your Approval
- ☑ For Your Information
- ☐ For Your Signature
- ☐ Note and Return to me
- ☐ Note and Send to Files
- ☐ Note and Pass On

COMMENTS;

I will send You A Copy
Of The Final Transmittal.

Date 3/25/71 From P.T.

Form HQ 37

FROM

TO J. W. GOLDENBERG ✓ R. CONREAUX

W. G. GRUBB ✓

W. LOCKE

RETURN TO

CERRO COPPER & BRASS COMPANY
Division of CERRO CORPORATION
P. O. BOX 681
EAST ST. LOUIS, ILLINOIS 62202

SUBJECT WATER POLLUTION ABATEMENT PROGRAMS DATE 2/26/71

MESSAGE IT IS PLANNED TO AWARD MONSANTO-BIODIRE CO. AN ENGINEERING CONTRACT TO MEASURE AND IDENTIFY OUR SEWER EFFLUENTS AND TO RECOMMEND TREATMENT POINTS WHERE INDICATED. THEIR REPRESENTATIVES WILL MEET WITH US ON FRIDAY, MARCH 5TH 10 AM. IN THE ADMINISTRATIVE OFFICES TO DISCUSS THE TOTAL APPROACH INITIATIVELY SCHEDULED TO BEGIN MARCH 8TH 1971

RETURN TO → SIGNED

REPLY PLEASE ATTEND THIS MEETING.

cc. W. F. DUNNICK
C. O. JUGER

SIGNED DATE / /

SEND PARTS 1 AND 3 WITH CARBON INTACT - PART 3 WILL BE RETURNED WITH REPLY.

Redifprmo 4S 472

C311-47

MONSANTO BIODIZE

3/13 SPENT MOST OF DAY TRACING LINES BLDG 80, LIFT STA AT 80, AND POND.

MTG MAR 5 '71

TO BEGIN TESTING 3/8/71

ACTUALLY STARTED ABOUT 3/12 — #3 ANODE RUNNING BUT POLLUTION SYSTEM NOT USED 100% OF TIME.

#4 ANODE POLL. SYSTEM DOWN — MATERIAL BEING TESTED.

OBJECTIVES

The objectives of this study were to:

(1) measure the volume of water being discharged by the individual industries and the residential areas of the Village of Sauget, Illinois.

(2) measure the level of the suspended matter in the waste water discharges of the contributing industries and residential areas.

(3) present a revised rate schedule for distributing the operating costs for the Village of Sauget Treatment Plant among contributing industries and the Village of Sauget.

(4) gather proportionate to flow samples for general analytical characterization. The results of these tests are to be presented in reports of treatability work and overall waste characterization.

RESULTS AND CONCLUSIONS

The basis for the distribution of operating costs for the Village of Sauget Treatment Plant has been specified as the amount of the contribution of waste water and suspended matter to the facility. Mobil Oil Company's waste contribution has become very insignificant since their shutdown during the first part of October, 1970. Cerro Copper and Brass Company's waste flow contribution has increased significantly from 5.58% of the total to 10.48% of the total. All other flow proportions remained at nearly the same level.

The changes in the measured amounts of suspended matter being discharged were quite significant compared with those found in previous studies. Monsanto's discharges increased 55.4% over the previous level or from 12,000 lbs. per day to 18,657 lbs. per day. Midwest Rubber's discharges decreased from 10,000 lbs. per day to 2,250 lbs. per day or 77.5%. Cerro Copper and Brass's contribution increased from 1,600 lbs. per day to 5,280 lbs. per day or a 2.3 fold increase. The total lbs. per day of solids handled by the treatment plant, however, has increased by only 7%. A distribution of 68.5% of the operating cost to the flow contribution and 31.5% of the cost to the solids contribution has been used for proportioning the operating costs of the primary facility.

The following summary table shows the previous distributions and the revised distributions resulting from the Monsanto Biodize Systems' study.

SUMMARY

VILLAGE OF SAUGET PRIMARY TREATMENT PLANT

DISTRIBUTION OF OPERATION COSTS

Contributor	Revised Equalized Avg. Flow MGD	Revised Distrib. % of Flow	Previous Distrib. % of Flow	Revised Equal.Sus. Solids (lbs/day)	Revised Distrib. % of Sol.	Previous Distrib. % of Solids	Revised Distrib.of Treatment % Costs	Previous Distrib. % of Costs
American Zinc Company	4.33	18.154	21.23	2,160	7.660	9.50	14.848	15.60
Cerro Copper & Brass Co.	2.50	10.480	5.58	5,122	18.166	5.24	12.901	5.42
Mobil Oil Company	0.014	0.058	5.89	7	0.025	14.41	0.048	9.99
Monsanto Company	14.80	62.047	61.14	18,657	66.168	43.57	63.345	52.70
Midwest Rubber Reclaiming	2.08	8.720	5.87	1,845	6.543	27.19	8.034	16.10
Sterling Steel Casting Co.	0.072	0.303	0.29	75	0.268	0.09	0.292	0.19
Village of Sauget*	0.042	0.238	0	330	1.170	-	0.532	-
	23.836	100.000	100.000	28,196	100.000	100.000	100.000	100.000

*Includes Rogers Cartage Company Waste Discharges

Monsanto

Monsanto Biodize Systems Inc.
510 Northern Boulevard
Great Neck, New York 11021
Phone (516) 466-5511

September 24, 1970

Mr. G. L. Bratsch, Chairman
Sauget Sanitary Development and
Research Association
Monsanto Company
Sauget, Illinois - 62201

Dear Mr. Bratsch:

Thank you for the opportunity given Messrs. Boehm, Jones and myself to present to the Sanitary Development and Research Association our report of progress on September 14th. We value highly every opportunity to talk with the members jointly. As you suggest, we will plan to be present for a report at each of the regular meetings.

In our report we noted that work is proceeding in accordance with the original schedule, and that the information so far collected confirms the understanding we had about the scope of the job. Flow measurements of individual contributing waste streams are in progress. These measurements are essential for our use in the remainder of the study, and they are also of immediate interest to members of the Association. The results of this study will be available in November.

In our report we also drew attention to the liklihood that in-plant pre-treatment or materials recovery programs would prove economically desirable for some of the members. We will soon be offering proposals to some of them suggesting concurrent work. We believe this is consistent with the overall plan envisioned by the Association and communicated to us by Mr. Pierle.

BIODIZE
Monsanto
BIODIZE SYSTEMS INC

C311-50

A discussion of the possible impact of the Mobil Refinery shutdown, the Midwest Rubber Reclaiming Company strike, and the planned reductions in Monsanto Company discharges produced two conclusions:

(1) We must develop a process which will be able to accept "real life" situations of this type, and therefore data collected during this period will be useful.

(2) For certain purposes (such as establishing a rate schedule), it may be desirable to repeat later the flow measurement and waste characterization work.

We believe that the Village will wish to conduct some form of sewer inspection. Our engineers will present some alternative schemes to Mayor Sauget for consideration.

The cooperation which has been offered to Mr. Jerry Jones, Site Engineer, is very much appreciated. The member companies will soon also be seeing Messrs. Starzyck and Suchanek who have joined Mr. Jones.

We will look forward to our next report on November 9, 1970.

Very truly yours,

C. L. Knowles, Jr.
Director of Commercial Technology

CLK/bg

cc: Messrs. Otis Banes
T. W. Dalton
W. E. Dunnick
Howard R. Erwin
Michael Foresman
Paul Hodges
Darold Jackson
Harry A. Lutz
Leo Sauget
Paul Sauget
B. R. Williams

9-30-70 Copied / W. E. Dunnick
CC P TANDLER
J. GOLDENBERG
W. GRIFF
J. STARZYCK
F. EHRHART.
NOTE PORTIONS UNDERSCORED

OTHER ADDRESSEES • FOR INFORMATION

CC: J. W. Goldenberg
R. Conreaux
G. Perschbacher
File 1104

CERRO COPPER & BRASS COMPANY

DIVISION OF **CERRO CORPORATION**

INTERNAL MEMORANDUM

Form HQ-10 SHOW NAME, TITLE AND CORPORATION OF ADDRESSEE AND ADDRESSOR

TO: Tom O'Brien

DATE: August 11, 1970

FROM: Bill Graff

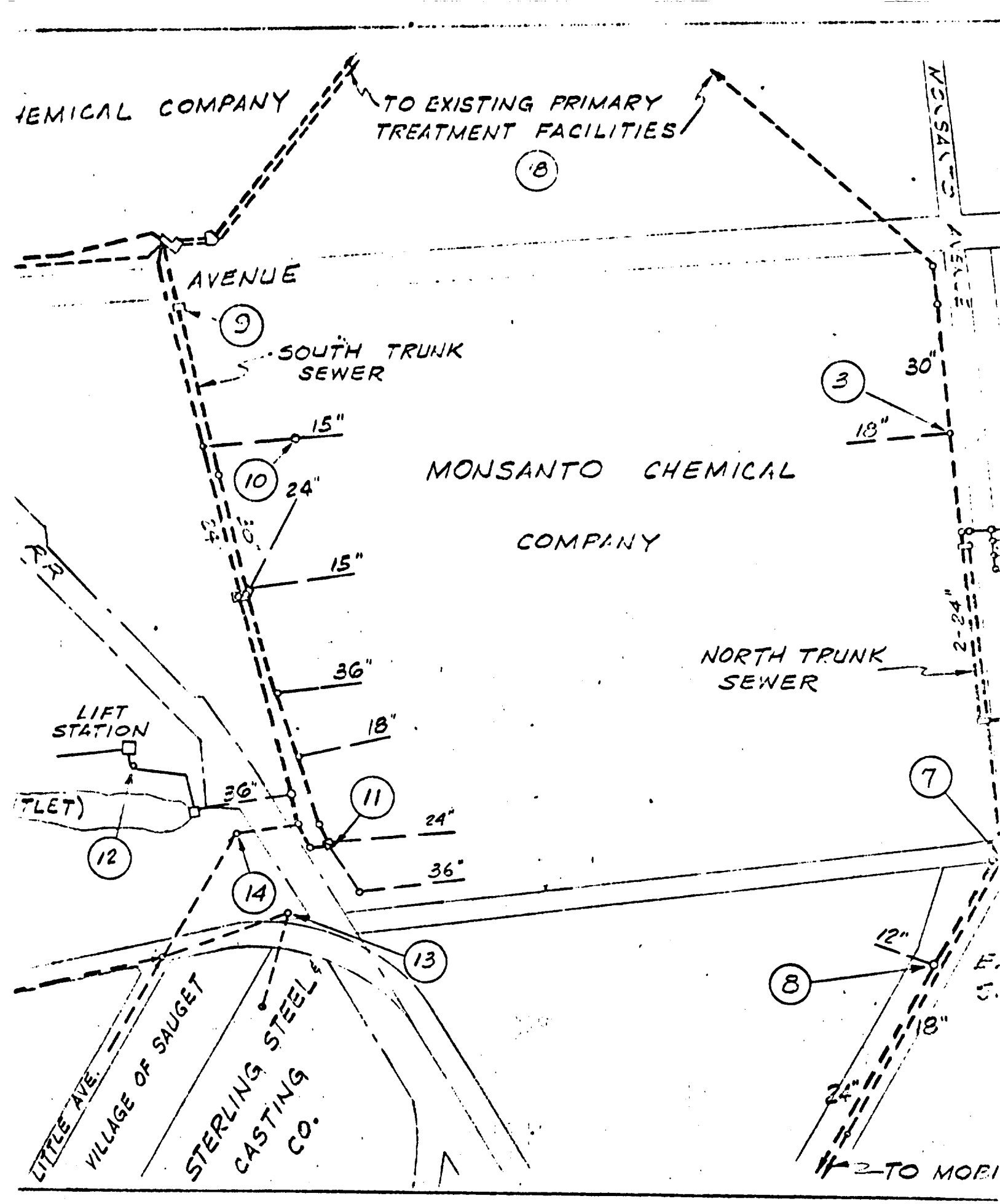
SUBJECT: SEWERAGE SYSTEM MEASUREMENT

Mr. Jerry Jones, an Engineer with Monsanto Biodize Systems, Inc. will be supervising the sewerage measurement work in the plant off and on for a number of weeks. Please arrange it so that he can sign in and out on his various trips as an outside contractor.

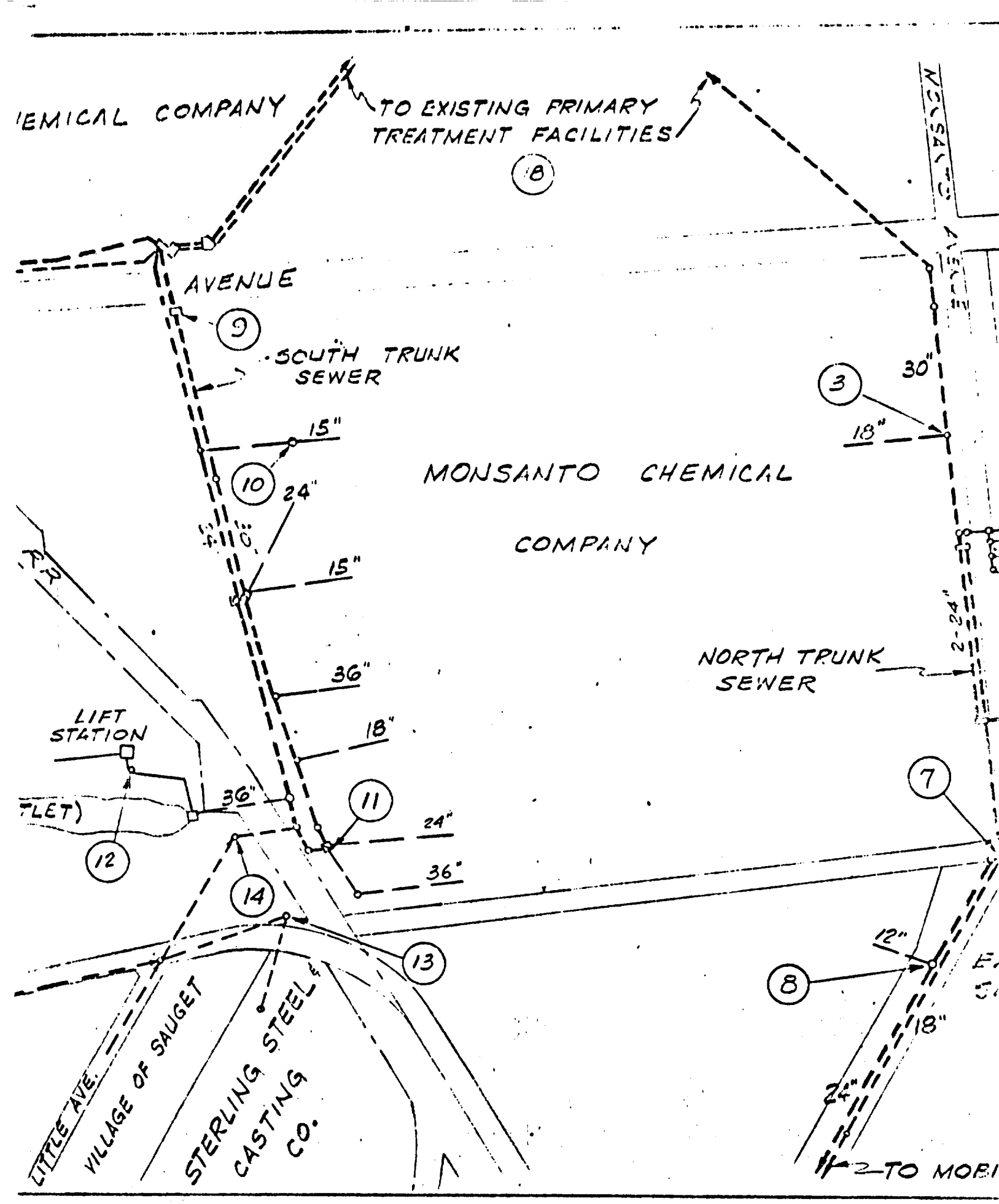
I've given him Bob and George's names to contact if he needs any technical information on our waste disposal.

BG/as

C311-51


EMICAL COMPANY
TO EXISTING PRIMARY TREATMENT FACILITIES
8
AVENUE
9
SOUTH TRUNK SEWER
15"
10
24"
24"
15"
MONSANTO CHEMICAL COMPANY
3
30"
18"
NORTH TRUNK SEWER
2-24"
36"
18"
LIFT STATION
(TLET)
36"
12
11
24"
36"
14
7
13
12"
8
18"
24"
TO MOBI
LITTLE AVE.
VILLAGE OF SAUGET
STERLING STEEL CASTING CO.

C311-53


IEMICAL COMPANY
TO EXISTING PRIMARY TREATMENT FACILITIES
18
AVENUE
9
SOUTH TRUNK SEWER
15"
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MONSANTO CHEMICAL COMPANY
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NORTH TRUNK SEWER
2-24"
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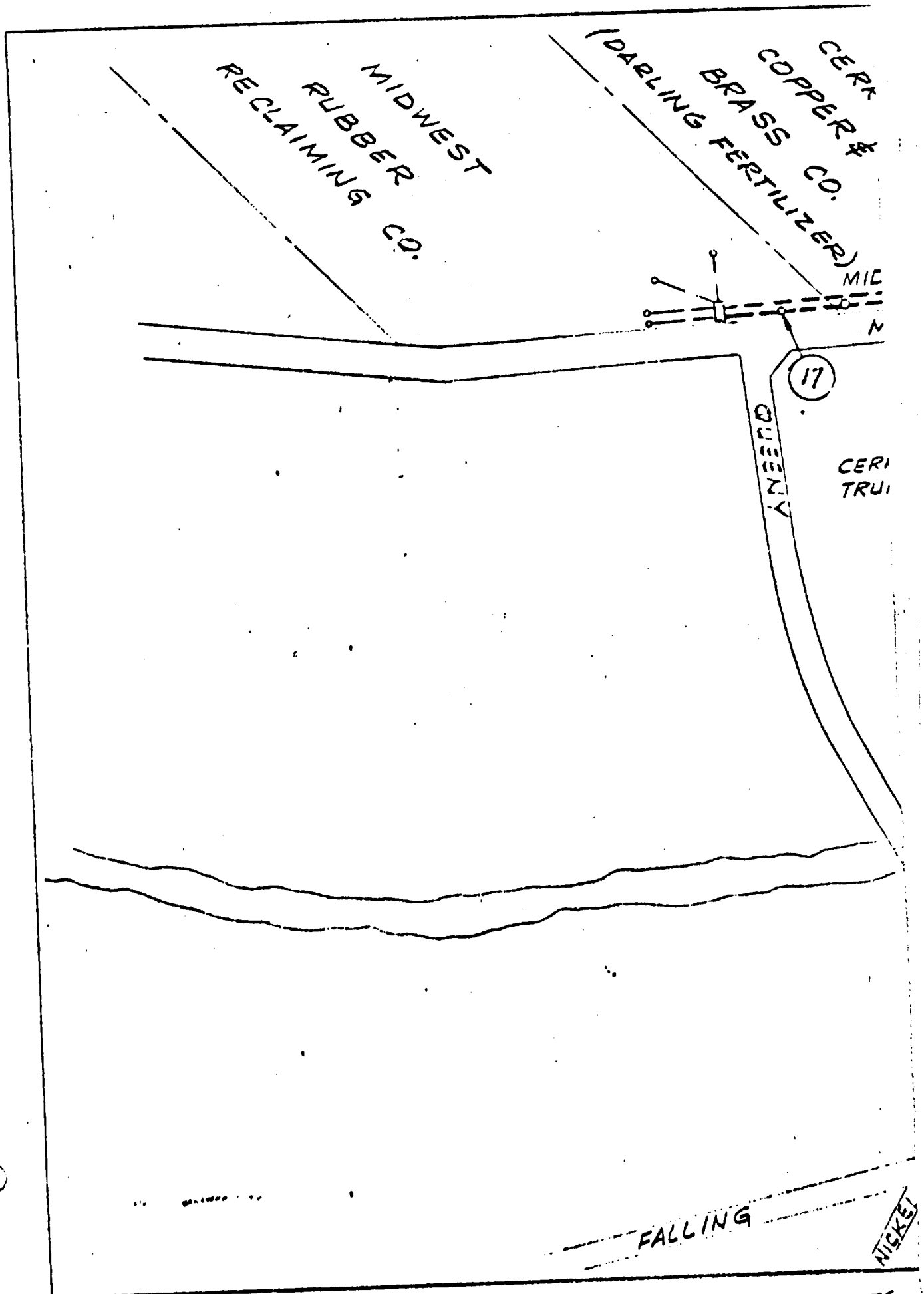
TO MOBI
LITTLE AVE.
VILLAGE OF SAUGET
STERLING STEEL CASTING CO.

C311-54


MIDWEST
RUBBER
RECLAIMING CO.
(DARLING FERTILIZER)
COPPER &
BRASS CO.
CERR
MIC
N
17
QUENNY
CERI
TRUI
FALLING
NISKEY

C311-55

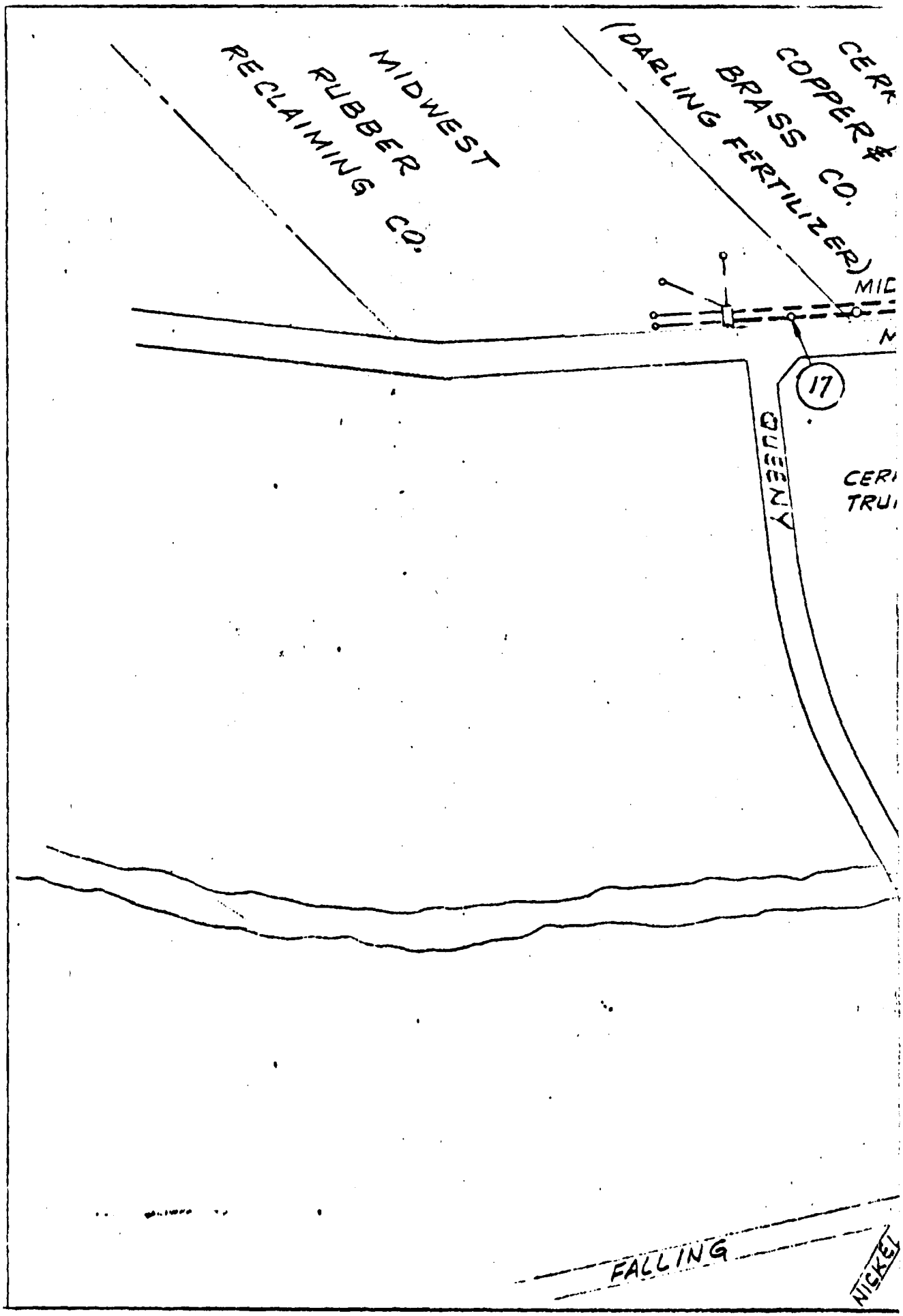
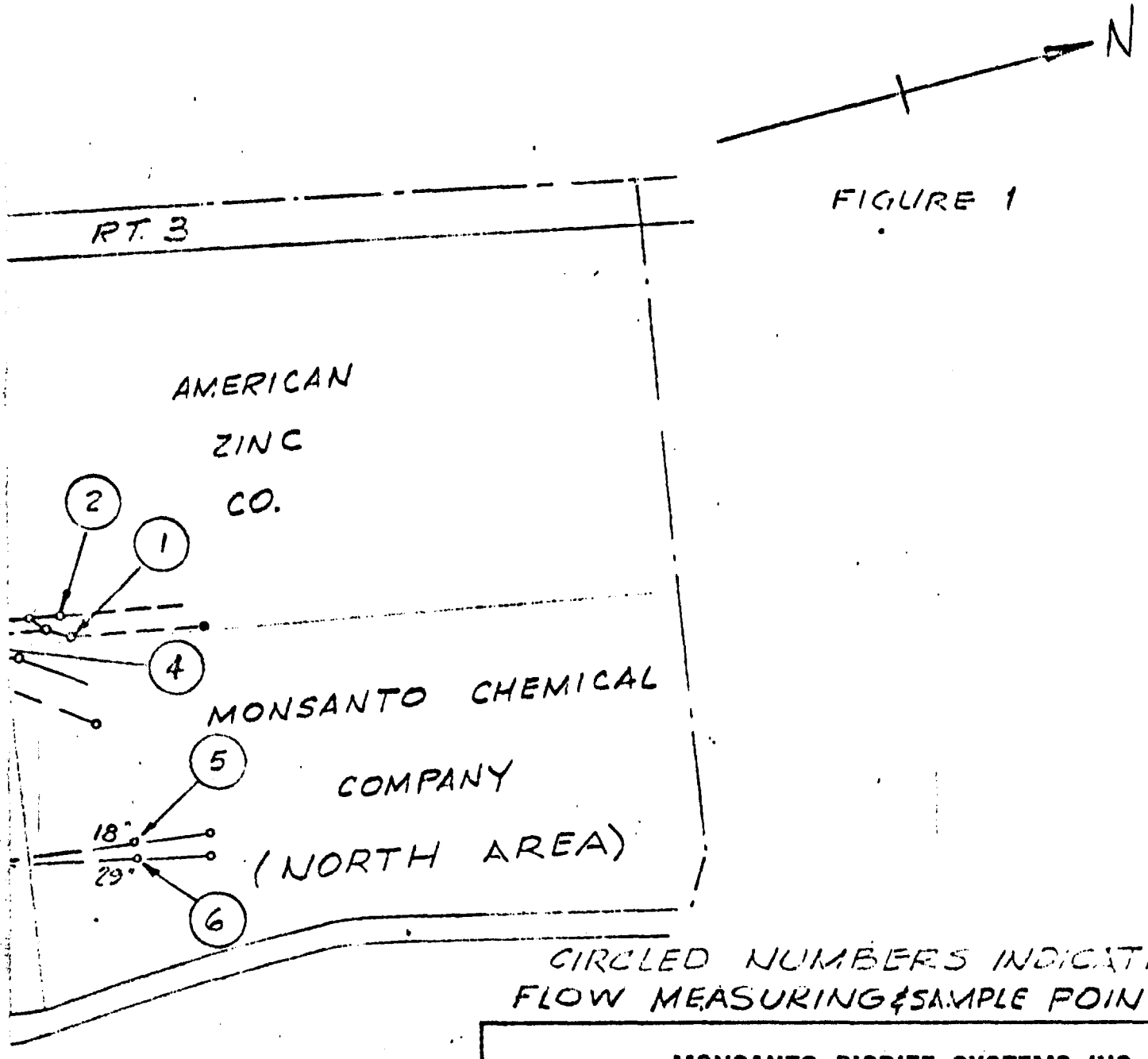

MIDWEST
RUBBER
RECLAIMING CO.
(DARLING FERTILIZER)
BRASS CO.
17
QUEENY
FALLING

FIGURE 1



CIRCLED NUMBERS INDICATE FLOW MEASURING & SAMPLE POINTS.

OMPILED FROM
STING PLATS & FIELD
IRCH.

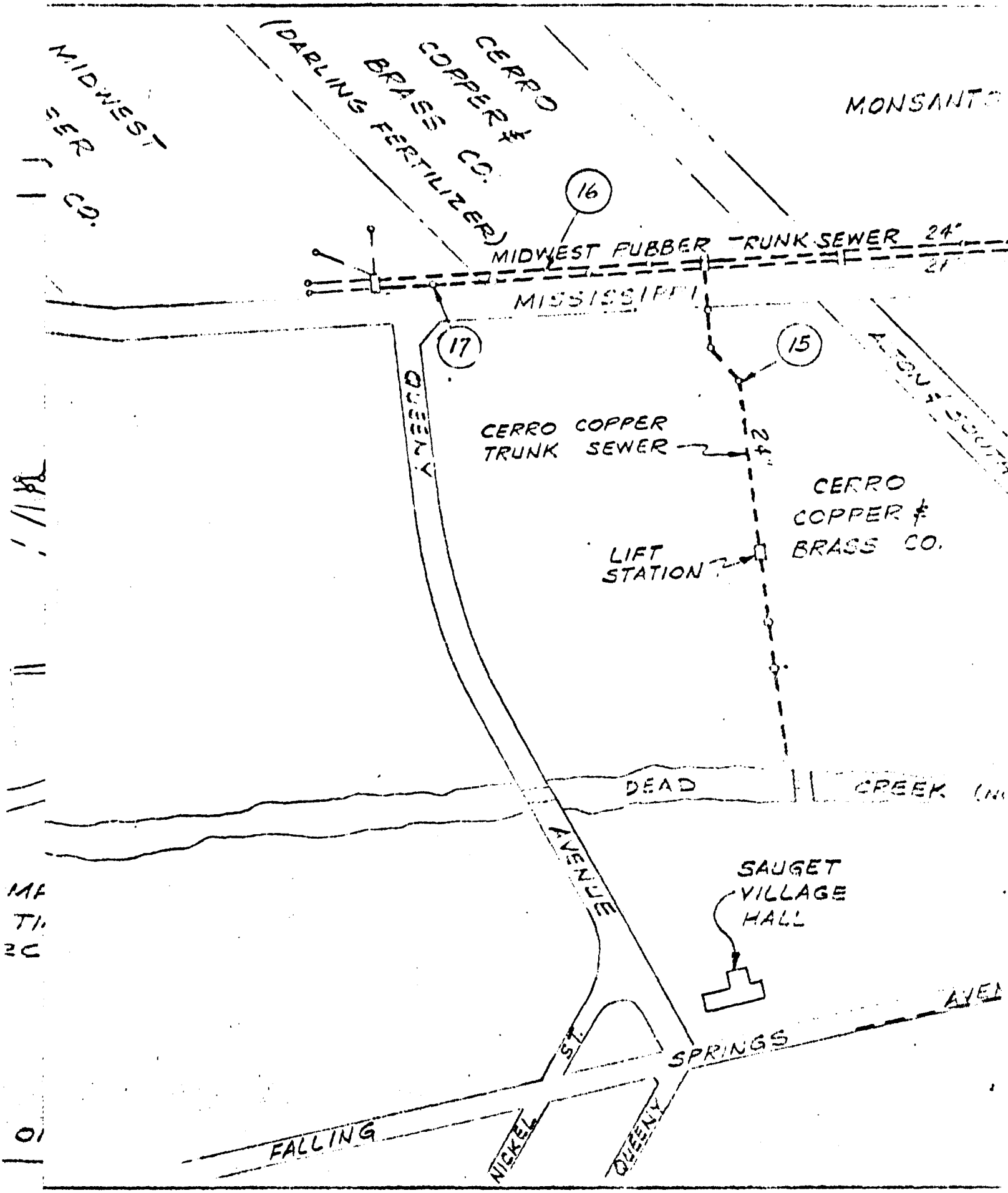
OIL

MONSANTO BIODIZE SYSTEMS INC.
510 NORTHERN BOULEVARD
GREAT NECK, NEW YORK 11021

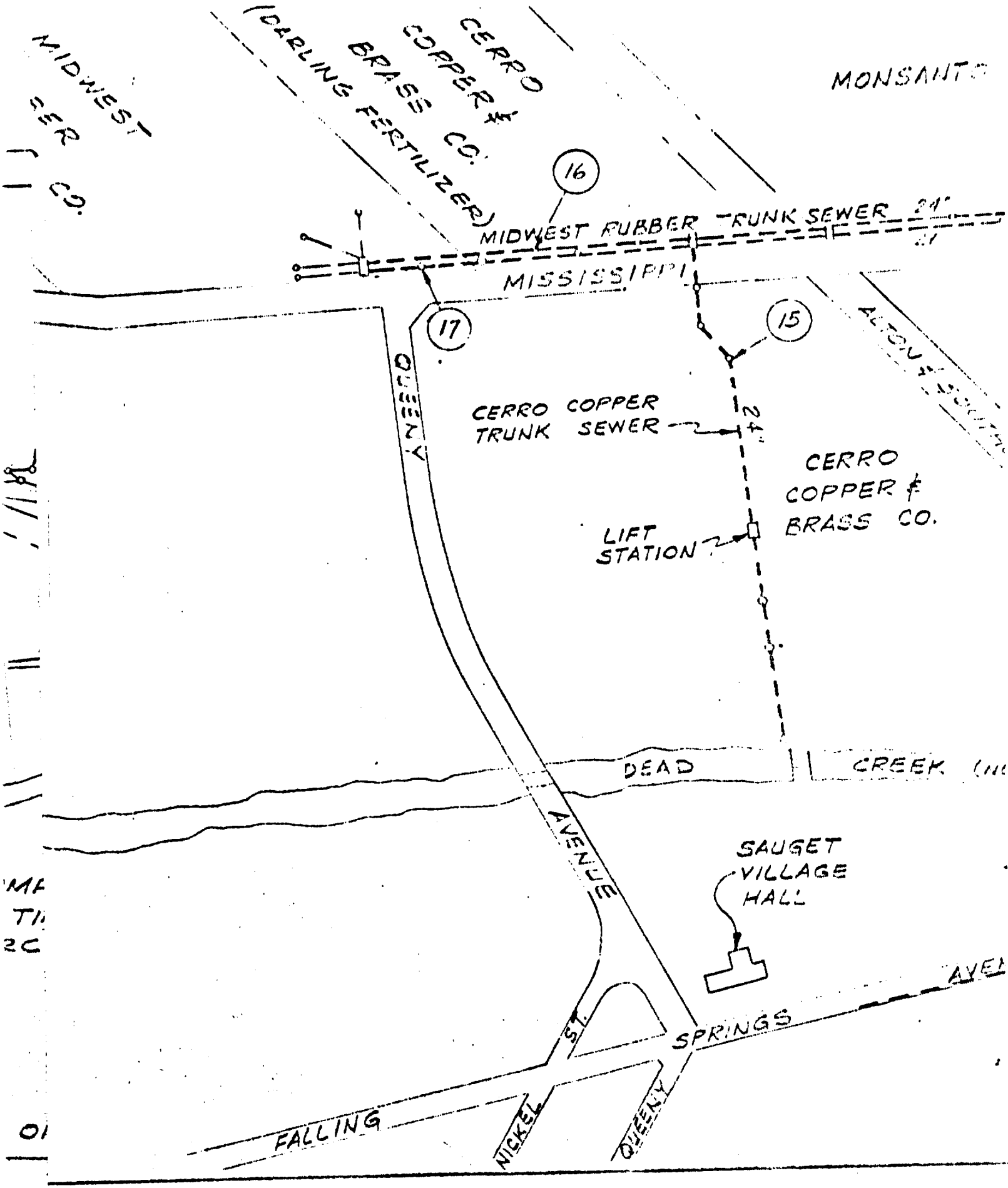
SEWERAGE SYSTEM, VILLAGE OF SAUGET
SAMPLING POINTS & FLOW MEASURING LOCATIONS FOR PHASE I

	BY	DATE	APPROVED	DATE	JOB NO.
DRAWN	REH	8-4-70	JLJ	8-5-70	222
CHECKED					DWG. NO. X-101
SCALE	1"=300'				

C311-57


MIDWEST
SER CO.
CERRO
COPPER &
BRASS CO.
(DARLING FERTILIZER)
MONSANTO
16
MIDWEST RUBBER TRUNK SEWER 24"
MISSISSIPPI
17
15
QUEENY
CERRO COPPER
TRUNK SEWER
12"
CERRO
COPPER &
BRASS CO.
LIFT
STATION
DEAD
CREEK
AVENUE
SAUGET
VILLAGE
HALL
SPRINGS
FALLING
NICKEL
ST.
QUEENY

C311-58


MIDWEST
CO.
CERRO
COPPER &
BRASS CO.
(CARLING FERTILIZER)
MONSANTO
16
MIDWEST RUBBER TRUNK SEWER 24"
MISSISSIPPI
17
15
QUEEN
CERRO COPPER
TRUNK SEWER
24"
CERRO
COPPER &
BRASS CO.
LIFT
STATION
DEAD
CREEK
AVENUE
SAUGET
VILLAGE
HALL
SPRINGS
FALLING
NICKEL
QUEEN

C311-59

CERRO COPPER & BRASS COMPANY
DIVISION OF CERRO CORPORATION

INTERNAL MEMORANDUM

Form HC-10 SHOW NAME, TITLE AND CORPORATION OF ADDRESSEE AND ADDRESSOR

OTHER ADDRESSEES • FOR INFORMATION

cc: W. E. Dunnick
J. Goldenberg
B. Graff
R. Wigger
File (3)

TO: P. Tardler, Technical Manager DATE: June 24, 1971

FROM: W. Lorenz, Laboratory Director

SUBJECT: WATER POLLUTION ANALYSES

Attached are cur analytical results from the second set of water samples submitted to us by Monsanto Biodize.

WPL:elk

C311-60

DATE H. O'Bryan 6-19-71

SHIFT Late

Analyzed for: Zn

Limit of detection: .02 PPM

Monsanto Biological Water Effluent Samples

	SAMPLE Grab #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT PPM	METHOD OF ANALYSIS	REMARKS Filter
1	1424	Zn	1	14.0	AA	S4 1 5P
2	1425			9.2		" 2 6P
3	1426			11.0		" 3 7P
4	1427			5.5		" 4 8P
5	1428			8.7		" 5 9P
6	1429			10.0		" 6 10P
7	1430			5.0		" 7 11P
8	1431			9.7		" 8 12A
9	[illegible]			9.7		" 9 1A
10	1433			7.0		" 10 2A
11	1434			6.2		" 11 3A
12	1435			12.0		" 12 4A
13	1436			4.8		" 13 5A
14	1437			9.7		" 14 6A
15	1438			9.7		" 15 7A
16	1439			8.8		" 16 8A
17	1440			8.7		" 17 9A
18	1441			9.7		" 18 10A
19	1442			4.0		" 19 11A
20	1443			6.0		" 20 12P
21	1444			7.8		" 21 1P
22	1445			4.2		" 22 2P

NAME — DATE H. O'Bryan

SHIFT 1st

Analyzed for: ZN

Limit of detection .02 PP.

Monsanto Biology Water Pollution Sampling

	SAMPLE Mice #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT PPm	METHOD OF ANALYSIS	REMARKS
23	1446	ZN	1	9.7	AA	S4 23 3P
24	1447			9.5		" 24 4P
25	1448			20.0		S5 1 6P
26	1449			4.3		" 2 7P
27	1450			7.0		" 3 8P "
28	1451			7.1		" 4 9P "
29	1452			6.8		" 5 10P "
30	1453			9.1		" 6 11P "
31	1454			6.8		" 7 12A "
32	1455			6.8		" 8 1A "
33	1456			7.0		" 9 2A "
34	1457			7.2		" 10 3A "
35	1458			7.2		" 11 4A "
36	1459			12.0		" 12 5A "
37	1460			7.0		" 13 6A "
38	1461			7.0		" 14 7A "
39	1462			3.8		" 15 8A "
40	1463			10.0		" 16 9A "
41	1464			10.0		" 17 10A "
42	1465			9.0		" 18 11A "
43	1466			9.0		" 19 12P "
44	1467			3.1		" 20 1P "

NAME Edwin L. Bryan

DATE 1st Shift

SHIFT 6/19/71

Analyst for: Fe

Limit of Detection: 0.4 ppm

Manganese Particle Size Distribution Survey

	SAMPLE Micron	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT ppm	METHOD OF ANALYSIS	REMARKS Pump
45	1468	Fe	1	2.7	A.A.	Sta 21 3p 5/
46	1469			3.0		" 22 3p "
47	1470			9.7		" 23 4p "
48	1471			9.5		" 24 5p "
49	1472			3		Sta 1 4:45 p 1/
50	1473			3		" 2 5:45 "
51	1474			3		" 3 1:45 "
52	1475			3.2		" 4 7:45 "
53	1476			3.3		" 5 "
54	1477			3.2		" 6 9:45 "
55	1478			3.5		" 7 10:45 "
56	1479			4.5		" 8 11:45 "
57	1480			4.5		" 9 12:45 5/
58	1481			4.6		" 10 1:45 "
59	1482			4.3		" 11 2:45 "
60	1483			5		" 12 3:45 "
61	1484			4.9		" 13 4:45 "
62	1485			4.2		" 14 5:45 "
63	1486			3.8		" 15 6:45 "
64	1487			4.0		" 16 7:45 "
65	1488			4.2		" 17 8:45 "
66	1489			4.0		" 18 9:45 "

DATE 6/19/71

SHIFT 1st

Analysis for: Zn

Limit of detection: 0.02 ppm

Monsanto Biology Water Pollution Analysis

	SAMPLE Mine #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT ppm	METHOD OF ANALYSIS	REMARKS Time
67	1490	Zn	1	4.0	A.A.	6/19 10:45 a
68	1491			3.6		" 20 11:45 a
69	1492			4.0		" 21 12:45 p
70	1493			3.8		" 22 1:45 p
71	1494			3.8		" 23 2:45 p
72	1495			16.0		6/1 6 p
73	1496			13.0		" 2 7 p
74	1497			10.0		" 3 8 p
75	1498			12.5		" 4 9 p
76	1499			70.0		" 5 10 p
77	1500			70.0		" 6 11 p
78	1501			50.0		" 7 12 p
79	1502			17.0		" 8 1a
80	1503			20.0		" 9 2a
81	1504			17.0		" 10 3a
82	1505			13.0		" 11 4a
83	1506			11.0		" 12 5a
84	1507			16.0		" 13 6a
85	1508			17.0		" 14 7a
86	1509			15.0		" 15 8a
87	1510			11.0		" 16 9a
88	1511			10.0		" 17 10a

DATE _____ Analyst: Zn

SHIFT 1st Limit of Detection: 0.02 ppm

Minnesota Valley Testing Laboratories

	SAMPLE	SPECIES ON PROPERTY ANALYZED	NUMBER OF RUNS	RESULT ppm	METHOD OF ANALYSIS	REMARKS Page 5
87	1512	Zn	1	14.0	A.A.	Sq 18 11a
90	1513			12.0		" 19 12a
91	1514			8.2		" 20 1p
92	1515			8.1		" 21 2p
93	1516			16.0		" 22 3p
94	1517			8.3		" 23 4p
95	1518			80		Sq 1 5p
96	1519			50		" 2 6p
97	[illegible]			45		" 3 7p
98	1521			45		" 4 8p
99	1522			150		" 5 9p
100	1523			400		" 6 10p
101	1524			320		" 7 11p
102	1525			180		" 8 12a
103	1526			49		" 9 1a
104	1527			14		" 10 2a
105	1528			50		" 11 3a
106	1529			49		" 12 4a
107	1530			26		" 13 5a
108	1531			33		" 14 6a
109	1532			50		" 15 7a
110	1533			50		" 16 8a

DATE 6/19/71

SHIFT 1st

Analyze for: Zn

Limit of Detection: 0.02 ppm

Mountain Bridge Water Testing Samples

	SAMPLE No.	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT ppm	METHOD OF ANALYSIS	REMARKS Fig. 6
111	1534	Zn	1	33	AA	Sp 9a 1
112	1535			15		" 18 10a
113	1536			14		" 19 11a
114	1537			17		" 20 12
115	1538			20		" 21 1p
116	1539			32		" 22 2
117	1540			18		" 23 3
118	1541			20		" 24 4p
119	1542			19.0		" 25 5
120	1543			38.0		" 2 6p
121	1544			50.0		" 3 7p
122	1545			48.0		" 4 8p
123	1546			41.0		" 5 9p
124	1547			20.0		" 6 10p
125	1548			17.0		" 7 11p
126	1549			5.0		" 8 12p
127	1550			2.8		" 9 1a
128	1551			10.0		" 10 2a
129	1552			8.8		" 11 3a
130	1553			5.0		" 12 4a
131	1554			5.0		" 13 5a
132	1555			4.6		" 14 6a

DATE H. O'Bryan 6-19-71

Analysis for: ZN

Limit of Detection: .02 PPM

SHIFT 1st

Monsanto Creek (Water Pollution) Samples

	SAMPLE Misc #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT PPM	METHOD OF ANALYSIS	REMARKS Page 7
133	1556	ZN	1	5.2	AA	S 15 7a
134	1557	↓	↓	6.2	↓	" 16 8a
135	1558			9.0		" 17 9a
136	1559			6.2		" 18 10a
137	1560			9.2		" 19 11a
138	1561			12.6		" 20 12n
139	1562			4.2		" 21 1p
140	1563			9.5		" 22 2p
141	1564			4.2		" 23 3p
142	1565			9.5		" 24 4p
143	1566			13.0		SAD 1 4^30 p
144	1567			4.1		" 2 5^30 p
145	1568			3.0		" 4 7^30 p
146	1569			4.6		" 5 8^30 p
147	1570			8.8		" 6 9^30 p
148	1571			6.3		" 7 10^30 p
149	1572			8.8		" 8 11^30 p
150	1573			9.2		" 9 12^30 a
151	1574			2.8		" 10 1^30 a
152	1575			4.2		" 11 2^30 a
153	1576			11.0		" 12 3^30 a
154	1577	↓	↓	5.3	↓	" 13 4^30 a

DATE 6-19-71 A. O'Bryan Analyzed for: ZN

SHIFT 1st Limit of Detection: .02 PPM

Mercury Existing Site Monitoring Network

	SAMPLE (Mine) #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT ppm	METHOD OF ANALYSIS	REMARKS Page 8
153	1578	ZN	1	6.0	AA	SAD 4 5:30
156	1579			5.3		" 15 6:30
157	1580			10.0		" 16 7:30
158	1581			9.8		" 17 8:30
159	1582			30.0		" 18 9:30
160	1583			9.0		" 19 10:30
161	1584			8.9		" 20 11:30
162	1585			6.2		" 21 12:30
163	1586			9.0		" 22 1:30
164	1587			11.0		" 23 2:30
165	1588			9.6		" 24 3:30
166	1589			1,000.0		SD 1 5:30
167	1590			50.0		" 2 6:30
168	1591			20.0		" 3 7:30
169	1592			18.0		" 4 8:30
170	1593			20.0		" 5 9:30
171	1594			20.0		" 6 10:30
172	1595			20.0		" 7 11:30
173	1596			20.0		" 8 12:30
174	1597			20.0		" 9 1:30
175	1598			37.0		" 10 2:30
176	1599			18.0		" 11 3:30

DATE H. O'Bryan 6-19-71 Analyze for: ZN

Limit of Detection: .02 PPM

SHIFT 1st

Monsanto [illegible] Water Pollution Samples

	SAMPLE Misc #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT PPM	METHOD OF ANALYSIS	REMARKS Page 9
177	1600	ZN	1	42.0	AA	SD 12 4^{30}a
178	1601	↓	↓	18.0	↓	" 13 5^{30}a
179	1602			9.7		" 14 6^{30}a
180	1603			9.0		" 15 7^{30}a
181	1604			12.0		" 16 8^{30}a
182	1605			11.0		" 17 9^{30}a
183	1606			15.0		" 18 10^{30}a
184	1607			13.0		" 19 11^{30}a
185	[illegible]			9.7		[illegible]
186	1609			6.8		" 21 1^{30}p
187	1610			3.7		" 22 2^{30}p
188	1611			3.3		" 23 3^{30}p
189	1612	▽	▽	5.4	▽	" 24 4^{30}p

DATE 4/6/71

SHIFT Late

Limit of detection: 0.2 ppm

Monsanto Biweekly Air Pollution Samples

	SAMPLE Given #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT PPM	METHOD OF ANALYSIS	REMARKS Filter
1	1424	F	1	0.3	AA	S4 1 5P
2	1425			0.2		" 2 6P
3	1426			0.2		" 3 7P
4	1427			<0.2		" 4 8P
5	1428			0.2		" 5 9P
6	1429			<0.2		" 6 10P
7	1430			<0.2		" 7 11P
8	1431			0.2		" 8 12A
9	[illegible]			<0.2		" 9 1A
10	1433			<0.2		" 10 2A
11	1434			<0.2		" 11 3A
12	1435			<0.2		" 12 4A
13	1436			<0.2		" 13 5A
14	1437			<0.2		" 14 6A
15	1438			0.2		" 15 7A
16	1439			0.2		" 16 8A
17	1440			0.2		" 17 9A
18	1441			0.5		" 18 10A
19	1442			<0.2		" 19 11A
20	1443			0.2		" 20 12P
21	1444			0.2		" 21 1P
22	1445			<0.2		" 22 2P

DATE N. Oregon 6-17-71

SHIFT 1st

Analysis for: Pb

Limit of detection .2 PPM

Monitor Blood Lead Analysis

	SAMPLE	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT PPM	METHOD OF ANALYSIS	REMARKS
	Mine #					Ref. #2
23	1446	Pb	1	<.2	AA	S4 " 23 3P
24	1447			<.2		" 24 4P
25	1448			0.3		S5 1 6P
26	1449			<.2		" 2 7P "
27	1450			<.2		" 3 8P "
28	1451			<.2		" 4 9P "
29	1452			<.2		" 5 10P "
30	1453			<.2		" 6 11P "
31	1454			<.2		" 7 12P "
32	1455			<.2		" 8 1A "
33	1456			<.2		" 9 2A "
34	1457			<.2		" 10 3A "
35	1458			<.2		" 11 4A "
36	1459			<.2		" 12 5A "
37	1460			<.2		" 13 6A "
38	1461			<.2		" 14 7A "
39	1462			<.2		" 15 8A "
40	1463			<.2		" 16 9A "
41	1464			<.2		" 17 10A "
42	1465			<.2		" 18 11A "
43	1466			<.2		" 19 12A "
44	1467			<.2		" 20 1P "

NAME: Ho O'Bryan
DATE: 6-17-71
SHIFT: 1st

Analyzed for: Pb
Limit of detection: .2 ppm

Monsanto Bridge Water Pollution Samples

	SAMPLE Misc #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT ppm	METHOD OF ANALYSIS	REMARKS
45	1468	Pb	1	<.2	A.A.	Sc 21 20 5/
46	1469	↓	↓	<.2	↓	" 22 3p "
47	1470			<.2		" 23 4p "
48	1471			<.2		" 24 5p "
49	1472			1.2		Sc 1 4⁴⁵ p
50	1473			1.2		" 2 5⁴⁵
51	1474			1.2		" 3 6⁴⁵ "
52	1475			1.2		" 4 7⁴⁵ "
53	1476			1.0		" 5 8
54	1477			1.1		" 6 9⁴⁵ "
55	1478			1.1		" 7 10⁴⁵ "
56	1479			2.3		" 8 11⁴⁵ "
57	1480			2.5		" 9 12⁴⁵ 5/
58	1481			2.5		" 10 1⁴⁵ "
59	1482			2.1		" 11 2⁴⁵ "
60	1483			.5		" 12 3⁴⁵ "
61	1484			.7		" 13 4⁴⁵ "
62	1485			.6		" 14 5⁴⁵ "
63	1486			1.2		" 15 6⁴⁵ "
64	1487			1.0		" 16 7⁴⁵ "
65	1488			1.0		" 17 8⁴⁵ "
66	1489	↓	↓	2.4	↓	" 18 9⁴⁵ "

DATE H. O'Bryan 6-17-71 Analyze for: Pb

SHIFT 1st Limit of Detection .2 PPM

Monsanto Beach Water Pollution Samples

	SAMPLE Misc #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT PPM	METHOD / OF ANALYSIS	REMARKS Page 4
67	1490	Pb	1	1.5	A.A.	S6 19 10 [illegible]
68	1491	↓	↓	3.9	↓	" 20 11⁴⁵
69	1492			1.0		" 21 12⁴⁵
70	1493			1.0		" 22 1⁴⁵
71	1494			1.0		" 23 2⁴⁵
72	1495			<.2		S7 1 6p
73	1496			2.2		" 2 7p
74	1497			2.7		" 3 8p
75	1498			4.7		" 4 9p
76	1499			4.7		" 5 10p
77	1500			6.2		" 6 11p
78	1501			14.5		" 7 12p
79	1502			11.0		" 8 1a
80	1503			10.2		" 9 2a
81	1504			1.2		" 10 3a
82	1505			5.0		" 11 4a
83	1506			2.1		" 12 5a
84	1507			8.3		" 13 6a
85	1508			6.3		" 14 7a
86	1509			6.3		" 15 8a
87	1510			.8		" 16 9a
88	1511	↓	↓	.8	↓	" 17 10a

DATE H. O'Bryan 6-12-71 Analyzed for: Pb

SHIFT 1st Limit of Detection: .2 ppm

Monsanto Study River Pollution - lead

	SAMPLE	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT PPM	METHOD OF ANALYSIS	REMARKS Page 5
89	1512	Pb	1	8.3	A.A.	Sq 18 11a
90	1513	↓	↓	1.0	↓	" 19 12a
91	1514			1.0		" 20 1p
92	1515			.5		" 21 2p
93	1516			1.2		" 22 3p
94	1517			.1		" 23 4p
95	1518			40.0		Sq 1 5p
96	1519			11.0		" 2 6p
97	[illegible]			8.3		" 3 7p
98	1521			8.5		" 4 8p
99	1522			19.5		" 5 9p
100	1523			18.5		" 6 10p
101	1524			19.0		" 7 11p
102	1525			18.5		" 8 12a
103	1526			3.2		" 9 1a
104	1527			1.3		" 10 2a
105	1528			11.0		" 11 3a
106	1529			12.0		" 12 4a
107	1530			8.4		" 13 5a
108	1531			5.5		" 14 6a
109	1532			9.5		" 15 7a
110	1533	▽	▽	105	▽	" 16 8a

DATE H. O'Bryan 6-17-71 — Range of Pb. Limit of Detection: .2 PPM

SHIFT 1st

Mineral Industries Water Testing Laboratory

	SAMPLE No.	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT ppm	METHOD OF ANALYSIS	REMARKS Fig. 6
111	1534	Pb	1	3.2	AA	Sp Gr 17
112	1535			1.9		" 18 10a
113	1536			1.8		" 19 11a
114	1537			.7		" 20 12a
115	1538			.6		" 21 1p
116	1539			2.0		" 22 2p
117	1540			1.2		" 23 3p
118	1541			.8		" 24 4p
119	[illegible]			2		[illegible]
120	1543			<.2		" 26 6p
121	1544			.4		" 3 7p
122	1545			1.4		" 4 8p
123	1546			1.7		" 5 9p
124	1547			1.2		" 6 10p
125	1548			.5		" 7 11p
126	1549			.5		" 8 12p
127	1550			<.2		" 9 1a
128	1551			.5		" 10 2a
129	1552			<.2		" 11 3a
130	1553			<.2		" 12 4a
131	1554			<.2		" 13 5a
132	1555			<.2		" 14 6a

DATE H. O'Bryon 6-17-71 [illegible]: 1-D

SHIFT 1st Limit of Detection: .2 PPM

Monsanto [illegible] Water Pollution Samples

	SAMPLE Misc #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT PPM	METHOD OF ANALYSIS	REMARKS Page 7
133	1556	Pb	1	.8	AA	Sta 15 7a
134	1557	↓	↓	.9	↓	" 16 8a
135	1558			.5		" 17 9a
136	1559			<.2		" 18 10a
137	1560			.7		" 19 11a
138	1561			.2		" 20 12n
139	1562			<.2		" 21 1p
140	1563			<.2		" 22 2p
141	1564			<.2		" 23 3p
142	1565			.2		" 24 4p
143	1566			<.2		SAD 1 4^{30}p
144	1567			<.2		" 2 5^{30}p
145	1568			<.2		" 4 7^{30}p
146	1569			.2		" 5 8^{30}p
147	1570			.2		" 6 9^{30}p
148	1571			.5		" 7 10^{30}p
149	1572			.2		" 8 11^{30}p
150	1573			<.2		" 9 12^{30}a
151	1574			<.2		" 10 1^{30}a
152	1575			<.2		" 11 2^{30}a
153	1576			1.0		" 12 3^{30}a
154	1577	▽	▽	<.2	▽	" 13 4^{30}a

DATE H. O'Ryan 6-17-71 Analysis for: Pb

SHIFT 1st Limit of Detection: .2 PPM

Monsanto Lindsay Plant Pollution Control

	SAMPLE (Mine) #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT ppm	METHOD OF ANALYSIS	REMARKS Time &
155	1578	Pb	1	<.2	AA	SAD 14 5:30 a
156	1579			<.2		" 15 6:30 a
157	1580			.2		" 16 7:30 a
158	1581			.3		" 17 8:30 a
159	1582			.3		" 18 9:30 a
160	1583			.2		" 19 10:30 a
161	1584			.12		" 20 11:30 a
162	1585			.5		" 21 12:30 p
[illegible]	[illegible]			?		" [illegible] 1:30 p
164	1587			2.9		" 23 2:30 p
165	1588			1.0		" 24 3:30 p
166	1589			2.9		SD 1 5:30 p
167	1590			2.9		" 2 6:30 p
168	1591			<.2		" 3 7:30 p
169	1592			<.2		" 4 8:30 p
170	1593			.7		" 5 9:30 p
171	1594			<.2		" 6 10:30 p
172	1595			<.2		" 7 11:30 p
173	1596			<.2		" 8 12:30 a
174	1597			.7		" 9 1:30 a
175	1598			.6		" 10 2:30 a
176	1599			.5		" 11 3:30 a

DATE H. O'Bryan 6-17-7 [illegible] Limit of detection: .2 ppm

SHIFT 1st

Monsanto [illegible] Water Pollution Samples

	SAMPLE Misc #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT PPM	METHOD OF ANALYSIS	REMARKS Page 9
177	1600	Pb	1	1.0	AA	50 12 4 30 a
178	1601	↓	↓	<.2	↓	" 13 5 30 a
179	1602	↓	↓	<.2	↓	" 14 6 30 a
180	1603	↓	↓	<.2	↓	" 15 7 30 a
181	1604	↓	↓	<.2	↓	" 16 8 30 a
182	1605	↓	↓	<.2	↓	" 17 9 30 a
183	1606	↓	↓	<.2	↓	" 18 10 30 a
184	1607	↓	↓	<.2	↓	" 19 11 30 a
185	[illegible]	↓	↓	.2	↓	[illegible] 20 12 30 p
186	1609	↓	↓	<.2	↓	" 21 1 30 p
187	1610	↓	↓	<.2	↓	" 22 2 30 p
188	1611	↓	↓	<.2	↓	" 23 3 30 p
189	1612	↓	↓	<.2	↓	" 24 4 30 p

DATE H. Bryan 6-17-71

Limit of detection: .02 PPM

SHIFT 1st

Monsanto Bridge Water Pollution Sampled

	SAMPLE Plant #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT PPM	METHOD OF ANALYSIS	REMARKS Page 1
1	1424	Cd	1	.07	AA	St 1 5P
2	1425			.06		" 2 6P
3	1426			.05		" 3 7P
4	1427			.05		" 4 8P
5	1428			.06		" 5 9P
6	1429			.06		" 6 10P
7	1430			.05		" 7 11P
8	1431			.07		" 8 12A
9	[illegible]			.05		" 9 [illegible]
10	1433			.06		" 10 2A
11	1434			.05		" 11 3A
12	1435			.05		" 12 4A
13	1436			.05		" 13 5A
14	1437			.05		" 14 6A
15	1438			.05		" 15 7A
16	1439			.05		" 16 8A
17	1440			.04		" 17 9A
18	1441			.1		" 18 10A
19	1442			.04		" 19 11A
20	1443			.04		" 20 12P
21	1444			.04		" 21 1P
22	1445			.03		" 22 2P

NAME [illegible]

DATE H. O'Byon 6-17-71

SHIFT 1st

Analyzed for Cd.

Limit of Detection .02 PPM

Monsanto [illegible] Collection [illegible]

	SAMPLE Mine #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT ppm	METHOD OF ANALYSIS	REMARKS [illegible]
23	1446	Cd.	1	.03	AA	S4 23 3P
24	1447	↓	↓	.02	↓	" 24 4P
25	1448			.02		S5 1 6P
26	1449			<.02		" 2 7P
27	1450			<.02		" 3 8P "
28	1451			<.02		" 4 9P
29	1452			<.02		" 5 10P "
30	1453			<.02		" 6 11P "
31	[illegible]			<.02		7 [illegible]
32	1455			.02		" 8 1A "
33	1456			.02		" 9 2A "
34	1457			.03		" 10 3A
35	1458			<.02		" 11 4A
36	1459			<.02		" 12 5A "
37	1460			<.02		" 13 6A "
38	1461			<.02		" 14 7A "
39	1462			<.02		" 15 8A "
40	1463			<.02		" 16 9A "
41	1464			<.02		" 17 10A "
42	1465			<.02		" 18 11A "
43	1466			<.02		" 19 12A "
44	1467	↓	↓	<.02	↓	" 20 1P "

DATE H. Oxnyen 6-17-71 — Analyzed for: Cd

Limit of Detection: .02

SHIFT 1st

Monsanto ... Water Pollution Samples

	SAMPLE Misc #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT ppm	METHOD OF ANALYSIS	REMARKS Page 3
45	1468	Cd	1	< .02	A.A.	So 21 2p
46	1469			< .02		" 22 3p
47	1470			< .02		" 23 4p
48	1471			< .02		" 24 5p
49	1472			1.0		S6 1 4⁴⁵p
50	1473			.9		" 2 5⁴⁵
51	1474			.8		" 3 6⁴⁵
52	1475			.75		" 4 7⁴⁵
53	1476			.75		" 5 8⁴⁵
54	1477			.7		" 6 9⁴⁵
55	1478			.7		" 7 10⁴⁵
56	1479			.75		" 8 11⁴⁵
57	1480			.8		" 9 12⁴⁵
58	1481			.75		" 10 1⁴⁵
59	1482			.6		" 11 2⁴⁵
60	1483			.5		" 12 3⁴⁵
61	1484			.5		" 13 4⁴⁵
62	1485			.55		" 14 5⁴⁵
63	1486			.55		" 15 6⁴⁵
64	1487			.7		" 16 7⁴⁵
65	1488			.95		" 17 8⁴⁵
66	1489			.95		" 18 9⁴⁵

DATE H. O'Bryan 6-17-71 Analyses for: Cd

SHIFT 1st Limit of Detection: .02 PPM

Monsanto Ready Water Effluent Survey

	SAMPLE Mine #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT PPM	METHOD OF ANALYSIS	REMARKS Hr. &
67	1490	Cd	1	.95	A.A.	56 10 45
68	1491			.95		" 20 11 45
69	1492			.9		" 21 12 45
70	1493			.7		" 22 1 45
71	1494			.55		" 23 2 45
72	1495			.75		Sq 1 6p
73	1496			.5		" 2 7p
74	1497			.6		" 3 8p
75	1498			3.0		" 4 9p
76	1499			4.5		" 5 10p
77	1500			4.0		" 6 11p
78	1501			2.8		" 7 12p
79	1502			.9		" 8 1a
80	1503			.45		" 9 2a
81	1504			.7		" 10 3a
82	1505			.55		" 11 4a
83	1506			.3		" 12 5a
84	1507			.3		" 13 6a
85	1508			.65		" 14 7a
86	1509			.7		" 15 8a
87	1510			.4		" 16 9a
88	1511			.2		" 17 10a

DATE H. O'Byan 6-17-71 Analyst: Col.

SHIFT 1st Limit of Detection: .02 PPM

Mercuric Chloride Solution

	SAMPLE	SPECIFY OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT PPM	METHOD OF ANALYSIS	REMARKS Tube 5
89	1512	Col	1	.2	A.A.	Sq 18 11a
90	1513			.15		" 19 12a
91	1514			.15		" 20 1p
92	1515			.05		" 21 2p
93	1516			.2		" 22 3p
94	1517			.1		" 23 4p
95	1518			4.0		Sq 1 5p
96	1519			3.2		" 2 6p
97	1520			2.0		" 3 7p
98	1521			2.2		" 4 8p
99	1522			9.0		" 5 9p
100	1523			15.0		" 6 10p
101	1524			12.0		" 7 11p
102	1525			8.0		" 8 12p
103	1526			1.0		" 9 1a
104	1527			3.3		" 10 2a
105	1528			3.3		" 11 3a
106	1529			2.0		" 12 4a
107	1530			1.0		" 13 5a
108	1531			.95		" 14 6a
109	1532			1.9		" 15 7a
110	1533			2.3		" 16 8a

DATE H. Okuyon 6-17-71 Analyze for: Cd

SHIFT 1st Limit of Detection): .02 PPM

Monsanto Krueger Water Pollution Samples

	SAMPLE Misc #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT PPM	METHOD OF ANALYSIS	REMARKS Fig. 6
111	1534	Cd	1	.8	AA	Sq 9a [illegible]
112	1535	↓	↓	.15	↓	" 18 10a
113	1536	↓	↓	.1	↓	" 19 11a
114	1537	↓	↓	.1	↓	" 20 12a
115	1538	↓	↓	.12	↓	" 21 1p
116	1539	↓	↓	.1	↓	" 22 2p
117	1540	↓	↓	.08	↓	" 23 3p
118	1541	↓	↓	.05	↓	" 24 4p
119	[illegible]	↓	↓	.05	↓	[illegible] 5p
120	1543	↓	↓	<.02	↓	" 2 6p
121	1544	↓	↓	.05	↓	" 3 7p
122	1545	↓	↓	.1	↓	" 4 8p
123	1546	↓	↓	.15	↓	" 5 9p
124	1547	↓	↓	.15	↓	" 6 10p
125	1548	↓	↓	.15	↓	" 7 11p
126	1549	↓	↓	.05	↓	" 8 12p
127	1550	↓	↓	.07	↓	" 9 1a
128	1551	↓	↓	.07	↓	" 10 2a
129	1552	↓	↓	.12	↓	" 11 3a
130	1553	↓	↓	.1	↓	" 12 4a
131	1554	↓	↓	.06	↓	" 13 5a
132	1555	↓	↓	.05	↓	" 14 6a

DATE H. O'Bryan 6-17-71

Analysis for: Cd

Limit of detection: .02 PPm

SHIFT 1st

Monsanto Bench Water Pollution Samples

	SAMPLE Misc #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT PPm	METHOD OF ANALYSIS	REMARKS Page 7
133	1556	Cd	1	.02	AA	Sa 15 7a
134	1557	↓	↓	.05	↓	" 16 8a
135	1558			.08		" 17 9a
136	1559			.08		" 18 10a
137	1560			.05		" 19 11a
138	1561			.2		" 20 12a
139	1562			.02		" 21 1p
140	1563			.02		" 22 2p
141	1564			.02		" 23 3p
142	1565			.02		" 24 4p
143	1566			.03		SAD 1 4^{30}p
144	1567			.03		" 2 5^{30}p
145	1568			.03		" 4 7^{30}"
146	1569			.04		" 5 8^{30}p
147	1570			.12		" 6 9^{30}p
148	1571			.15		" 7 10^{30}p
149	1572			.15		" 8 11^{30}p
150	1573			.1		" 9 12^{30}a
151	1574			.1		" 10 1^{30}a
152	1575			.05		" 11 2^{30}a
153	1576			.1		" 12 3^{30}a
154	1577	↓	↓	.06	↓	" 13 4^{30}a

DATE H. O'Bryan 6-17-21 Analyzed for: Cd

SHIFT 1st Limit of Detection: .02 PPM

Monsanto Building Water Pollution [illegible]

	SAMPLE (Misc) #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT ppm	METHOD OF ANALYSIS	REMARKS Page 8
155	1578	Cd	1	.05	AA	SAD 14 5^{30} a
156	1579			.05		" 15 6^{30} a
157	1580			.03		" 16 7^{30} a
158	1581			.03		" 17 8^{30} a
159	1582			.03		" 18 9^{30} a
160	1583			.02		" 19 10^{30} a
161	1584			.05		" 20 11^{30} a
162	1585			.05		" 21 12^{30} p
163	1586			.06		" 22 1^{30} p
164	1587			.1		" 23 2^{30} p
165	1588			.05		" 24 2^{30} p
166	1589			19.0		SD 1 5^{30} p
167	1590			3.0		" 2 6^{30} p
168	1591			.9		" 3 7^{30} p
169	1592			.46		" 4 8^{30} p
170	1593			.52		" 5 9^{30} p
171	1594			1.3		" 6 10^{30} p
172	1595			1.8		" 7 11^{30} p
173	1596			.65		" 8 12^{30} a
174	1597			.65		" 9 1^{30} a
175	1598			.45		" 10 2^{30} a
176	1599			.4		" 11 3^{30} a

DATE H. O'Bryan 6-17-71 Limit of Detection: .02 PPM

SHIFT 1st

[illegible] Water Pollution Samples

	SAMPLE Misc #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT PPM	METHOD OF ANALYSIS	REMARKS
177	1600	Cd	1	.48	AA	SD 12 4:30 a
178	1601			.4		" 13 5:30 a
179	1602			.06		" 14 6:30 a
180	1603			.06		" 15 7:30 a
181	1604			.1		" 16 8:30 a
182	1605			.13		" 17 9:30 a
183	1606			.2		" 18 10:30 a
184	1607			.2		" 19 11:30 a
185	[illegible]			.1		[illegible]
186	1609			.07		" 21 1:30 p
187	1610			.06		" 22 2:30 p
188	1611			.1		" 23 3:30 p
189	1612			.1		" 24 4:30 p

[illegible]: Fe

DATE H. O'Bryan 6-2-71 Limit of detection: .1 PPM

SHIFT 1st

[illegible]

	SAMPLE Sample #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT PPM	METHOD OF ANALYSIS	REMARKS Page 1
1	1424	Fe	1	2 PPM	AA	S4 1 5P
2	1425			1.1		" 2 6P
3	1426			2.3		" 3 7P
4	1427			.2		" 4 8P
5	1428			1.9		" 5 9P
6	1429			1.5		" 6 10P
7	1430			.2		" 7 11P
8	1431			2.1		" 8 12A
9	[illegible]			1.3		" 9 1A
10	1433			1.5		" 10 2A
11	1434			1.5		" 11 3A
12	1435			.8		" 12 4A
13	1436			.2		" 13 5A
14	1437			1.8		" 14 6A
15	1438			.5		" 15 7A
16	1439			1.0		" 16 8A
17	1440			2.3		" 17 9A
18	1441			1.1		" 18 10A
19	1442			.1		" 19 11A
20	1443			1.0		" 20 12P
21	1444			1.3		" 21 1P
22	1445			.1		" 22 2P

DATE He. Byon 6-2-71 [illegible] Fe

SHIFT 1st Limit of detection .1 P[illegible]

Monsanto [illegible]

SAMPLE Misc #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT ppm	METHOD OF ANALYSIS	REMARKS [illegible]
23 1446	Fe	1	.7 PPM	AA	S_4 23 3P
24 1447			.3		" 24 4P
25 1448			.7		S_5 1 6P
26 1449			.1		" 2 7P
27 1450			.7		" 3 8P
28 1451			1.0		" 4 9P
29 1452			1.4		" 5 10P
30 1453			.2		" 6 11P
31 [illegible]			1.4		" 7 12A
32 1455			.3		" 8 1A
33 1456			.4		" 9 2A
34 1457			1.0		" 10 3A
35 1458			1.6		" 11 4A
36 1459			1.7		" 12 5A
37 1460			.1		" 13 6A
38 1461			.2		" 14 7A
39 1462			.1		" 15 8A
40 1463			1.1		" 16 9A
41 1464			.3		" 17 10A
42 1465			.3		" 18 11A
43 1466			.1		" 19 12P
44 1467			< .1		" 20 1P

Date H. O'Bryan 6-2-71

Accuracy by Fe
Limit of detection: .1 PPM

SHIFT 1ST

Monsanto Brickyard Water Pollution Samples

SAMPLE	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT	METHOD OF ANALYSIS	REMARKS
Misc #			ppm		Pg 13
45 1468	Fe	1	< .1 PPM	A.A.	S6 21 2p
46 1469	↓	↓	< .1	↓	" 22 3p "
47 1470			.6		" 23 4p "
48 1471			.2		" 24 5p "
49 1472			17,000		S6 1 4^{45} p
50 1473			17,000		" 2 5^{45}
51 1474			16,000		" 3 6^{45} p "
52 1475			14,000		" 4 7^{45} p "
53 [illegible]			14,000		" 5 8^{45} p "
54 1477			13,000		" 6 9^{45} p "
55 1478			13,000		" 7 10^{45} p "
56 1479			6,700		" 8 11^{45} p "
57 1480			6,000		" 9 12^{45} a "
58 1481			5,900		" 10 1^{45} a "
59 1482			5,900		" 11 2^{45} a "
60 1483			6,200		" 12 3^{45} a "
61 1484			7,600		" 13 4^{45} a "
62 1485			9,300		" 14 5^{45} a "
63 1486			11,000		" 15 6^{45} a "
64 1487			1200		" 16 7^{45} a "
65 1488			1200		" 17 8^{45} a "
66 1489	↓	↓	1200	↓	" 18 9^{45} a "

DATE H. U Byam 6-2-71 Checking for Fe

SHIFT 1st Limit of Detection: .1 ppm

Monsanto Research Corporation Mound Laboratory

	SAMPLE Mound #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT ppm	METHOD OF ANALYSIS	REMARKS Hgt of
67	1490	Fe	1	12.00	A.A.	St 10 6p
68	1491			12.00		" 20 11p
69	1492			1200		" 21 12p
70	1493			1200		" 22 1p
71	1494			1200		" 23 2p
72	1495			.1		St 1 6p
73	1496			1.7		" 2 7p
74	1497			2.5		" 3 8p
75	1498			3.7		" 4 9p
76	1499			3.0		" 5 10p
77	1500			2.0		" 6 11p
78	1501			5.5		" 7 12p
79	1502			4.2		" 8 1a
80	1503			3.0		" 9 2a
81	1504			.1		" 10 3a
82	1505			1.9		" 11 4a
83	1506			.2		" 12 5a
84	1507			.4.0		" 13 6a
85	1508			2.2		" 14 7a
86	1509			1.6		" 15 8a
87	1510			.1		" 16 9a
88	1511			.1		" 17 10a

DATE H. O'Bryan 6-2-71 Analyzed for: Fe.

SHIFT 1st Limit of Detection: .1 PPM

Measurements [illegible]

	SAMPLE	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT PPM	METHOD OF ANALYSIS	REMARKS Page 5
87	1512	Fe	1	1.0 PPM	A.A.	Sq 18 11a
90	1513			.1		" 19 12a
91	1514			.1		" 20 1p
92	1515			.1		" 21 2p
93	1516			.1		" 22 3p
94	1517			<.1		" 23 4p
95	1518			5.6		Sq 1 5p
96	1519			7.5		" 2 6p
97	[illegible]			2.7		" [illegible] 7p
98	1521			3.7		" 4 8p
99	1522			3.8		" 5 9p
100	1523			2.5		" 6 10p
101	1524			1.7		" 7 11p
102	1525			2.3		" 8 12a
103	1526			.1		" 9 1a
104	1527			<.1		" 10 2a
105	1528			1.4		" 11 3a
106	1529			2.0		" 12 4a
107	1530			.1		" 13 5a
108	1531			<.1		" 14 6a
109	1532			2.0		" 15 7a
110	1533			.3		" 16 8a

DATE H. O'Bryan 6-2-71 — Analysis of: Fe

SHIFT 1st — Limit of Detection: .1 PPM

Monsanto Bridge Water Pollution Sampling

	SAMPLE Misc #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT PPM	METHOD OF ANALYSIS	REMARKS
111	1534	Fe	1	.1 PPM	AA	Sj 9a 1[illegible]
112	1535	↓	↓	< .1	↓	" 18 10a
113	1536			< .1		" 19 11a
114	1537			< .1		" 20 12p
115	1538			< .1		" 21 1p
116	1539			< .1		" 22 2p
117	1540			< .1		" 23 3p
118	1541			< .1		" 24 4p
11[illegible]	[illegible]			< .1		[illegible] " 5[illegible]
120	1543			< .1		" 2 6p
121	1544			< .1		" 3 7p
122	1545			< .1		" 4 8p
123	1546			< .1		" 5 9p
124	1547			.2		" 6 10p
125	1548			< .1		" 7 11p
126	1549			< .1		" 8 12p
127	1550			< .1		" 9 1a
128	1551			< .1		" 10 2a
129	1552			< .1		" 11 3a
130	1553			< .1		" 12 4a
131	1554			< .1		" 13 5a
132	1555	↓	↓	< .1	↓	" 14 6a

DATE H. O'Bryan 6-2-71

SHIFT 1st

Analyzed for: Fe
Limit of Detection: .1 ppm

Monsanto [illegible] Water Pollution Samples

	SAMPLE Misc #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT ppm	METHOD OF ANALYSIS	REMARKS Type 7
133	1556	Fe	1	.1 ppm	AA	Sa. 15 7a
134	1557	↓	↓	.1	↓	" 16 8a
135	1558			.1		" 17 9a
136	1559			<.1		" 18 10a
137	1560			.1		" 19 11a
138	1561			<.1		" 20 12a
139	1562			<.1		" 21 1p
140	1563			<.1		" 22 2p
[illegible]	[illegible]			<.1		[illegible] 3p
142	1565			.1		" 24 4p
143	1566			.1		SAD 1 4:30p
144	1567			<.1		" 2 5:30p
145	1568			<.1		" 4 7:30p
146	1569			<.1		" 5 8:30p
147	1570			<.1		" 6 9:30p
148	1571			<.1		" 7 10:30p
149	1572			<.1		" 8 11:30p
150	1573			<.1		" 9 12:30a
151	1574			<.1		" 10 1:30a
152	1575			<.1		" 11 2:30a
153	1576			.6		" 12 3:30a
154	1577	↓	↓	.1	↓	" 13 4:30a

DATE H. O'Ryan 6-2-71 Analysis for: Fe

SHIFT 1st Limit of Detection: .1 PPM

Monitor Existing Well Effluent Lines

	SAMPLE (Mine) #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT ppm	METHOD OF ANALYSIS	REMARKS Page 8
150	1578	Fe	1	< .1 PPM	AA	SD 14 5:30
151	1579			< .1		" 15 6:30
152	1580			.1		" 16 7:30
153	1581			.1		" 17 8:30
154	1582			.1		" 18 9:30
155	1583			< .1		" 19 10:30
161	1584			.8		" 20 11:30
162	1585			.5		" 21 12:30
163	1586			.7		" 22 1:30
164	1587			2.5		" 23 2:30
165	1588			.8		" 24 3:30
166	1589			10.0		SD 1 5:30
167	1590			7.6		" 2 6:30
168	1591			4.0		" 3 7:30
169	1592			6.7		" 4 8:30
170	1593			9.2		" 5 9:30
171	1594			.6		" 6 10:30
172	1595			1.1		" 7 11:30
173	1596			.2		" 8 12:30
174	1597			200		" 9 1:30
175	1598			160		" 10 2:30
176	1599			100		" 11 3:30

H. O'Bryon 6-2-71 Analyzed for: Fe

SHIFT 1st Limit of Detection: .1 PPM

Monsanto Public Water Pollution Samples

	SAMPLE Misc #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT PPM	METHOD OF ANALYSIS	REMARKS Page 9
177	1600	Fe	1	150 ppm	AA	SD 12 4^{30}a
178	1601			50		" 13 5^{30}a
179	1602			.3		" 14 6^{30}a
180	1603			.5		" 15 7^{30}a
181	1604			.2		" 16 8^{30}a
182	1605			.1		" 17 9^{30}a
183	1606			.1		" 18 10^{30}a
184	1607			.2		" 19 11^{30}a
185	[illegible]			.1		[illegible]
186	1609			.1		" 21 1^{30}p
187	1610			<.1		" 22 2^{30}p
188	1611			<.1		" 23 3^{30}p
189	1612			<.1		" 24 4^{30}p

Analyzed for: Cu

DATE H. O'Bryan 6-17-71

Limit of detection: .03 PPM

SHIFT 1st.

Monsanto [illegible] Water Pollution Samples

	SAMPLE Given #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT PPM	METHOD OF ANALYSIS	REMARKS Page 1
1	1424	Cu	1	.1	AA	St 1 5P
2	1425			.09		" 2 6P
3	1426			.1		" 3 7P
4	1427			.06		" 4 8P
5	1428			.1		" 5 9P
6	1429			.08		" 6 10P
7	1430			.06		" 7 11P
8	1431			.09		" 8 12A
9	[illegible]			.09		" 9 [illegible]
10	1433			.07		" 10 2A
11	1434			.09		" 11 3A
12	1435			.06		" 12 4A
13	1436			.05		" 13 5A
14	1437			.08		" 14 6A
15	1438			.07		" 15 7A
16	1439			.08		" 16 8A
17	1440			.08		" 17 9A
18	1441			.14		" 18 10A
19	1442			.07		" 19 11A
20	1443			.08		" 20 12P
21	1444			.1		" 21 1P
22	1445	↓	↓	.1	↓	" 22 2P

DATE H. O'Bryan 6-12-71 Analyzed for: Cu

SHIFT 1st Limit of detection .03 ppm

Monsanto [illegible]

	SAMPLE Misc #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT ppm	METHOD OF ANALYSIS	REMARKS
23	1446	Cu	1	.09	AA	S4 23 3p
24	1447			.08		" 24 4p
25	1448			.1		S5 1 6p
26	1449			.06		" 2 7p
27	1450			.1		" 3 8p
28	1451			.12		" 4 9p
29	1452			.12		" 5 10p
30	1453			.12		" 6 11p
31	1454			.1		" 7 12a
32	1455			.1		" 8 1a
33	1456			.1		" 9 2a
34	1457			.2		" 10 3a
35	1458			.6		" 11 4a
36	1459			.4		" 12 5a
37	1460			.5		" 13 6a
38	1461			.5		" 14 7a
39	1462			.4		" 15 8a
40	1463			.2		" 16 9a
41	1464			.2		" 17 10a
42	1465			.2		" 18 11a
43	1466			.2		" 19 12n
44	1467			.1		" 20 1p

NAME [illegible]

DATE 1/19/[illegible]

SHIFT 1st

Analyzed for Cu
Limit of Detection 0.1 ppm

[illegible] Samples

	SAMPLE Misc #	SPECIFY OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT ppm	METHOD OF ANALYSIS	REMARKS [illegible]
45	1468	Cu	1	0.1	AA	Ss 21 2p
46	1469			0.1		" 22 3p
47	1470			0.3		" 23 4p
48	1471			0.2		" 24 5p
49	1472			20		S6 1 1^45 p
50	1473			15		" 2 5^45
57	1474			12		" 3 6^45
52	1475			12		" 4 7^45
53	1476			12.5		" 5 8^45
54	1477			14		" 6 9^45
55	1478			17		" 7 10^45
56	1479			23		" 8 11^45
57	1480			28		" 9 12^45
58	1481			28		" 10 1^45
59	1482			24		" 11 2^45
60	1483			24		" 12 3^45
61	1484			18		" 13 4^45
62	1485			17		" 14 5^45
63	1486			20		" 15 6^45
64	1487			24		" 16 7^45
65	1488			34		" 17 8^45
66	1489			34		" 18 9^45

DATE 6/29/71 Analyze for: Cu

SHIFT 1st Limit of Detection: 0.03 ppm

Monsanto Creek Waters Collection Samples

	SAMPLE Mine #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT ppm	METHOD OF ANALYSIS	REMARKS Page 4
67	1490	Cu	1	3.2	A.A.	S6 19 10 45 a
68	1491	↓	↓	25	↓	" 20 11 45 a
69	1492			32		" 21 12 45 p
70	1493			25		" 22 1 45 p
71	1494			24		" 23 2 45 p
72	1495			4.2		S7 1 6p
73	1496			5.5		" 2 7p
74	1497			4.0		" 3 8p
75	[illegible]			2.0		" 4 9p
76	1499			7.0		" 5 10p
77	1500			9.0		" 6 11p
78	1501			14.5		" 7 12p
79	1502			9.5		" 8 1a
80	1503			6.8		" 9 2a
81	1504			4.0		" 10 3a
82	1505			4.5		" 11 4a
83	1506			2.5		" 12 5a
84	1507			4.0		" 13 6a
85	1508			4.0		" 14 7a
86	1509			1.0		" 15 8a
87	1510			1.0		" 16 9a
88	1511	↓	↓	1.0	↓	" 17 10a

DATE H. O'Bryon 6-17-71 Analysis for: Cu.

SHIFT 1st Limit of Detection: 03 PPM

Monsanto [illegible]

	SAMPLE	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT PPM	METHOD OF ANALYSIS	REMARKS Page 5
89	1512	Cu.	1	4.0	A.A.	S 18 11a
90	1513	↓	↓	1.6	↓	" 19 12a
91	1514			1.2		" 20 1p
92	1515			.8		" 21 2p
93	1516			4.0		" 22 3p
94	1517			.7		" 23 4p
95	1518			200.0		S 1 5p
96	1519			130.0		" 2 6p
97	[illegible]			47.0?		[illegible]
98	1521			22.0		" 4 8p
99	1522			41.0		" 5 9p
100	1523			50.0		" 6 10p
101	1524			37.0		" 7 11p
102	1525			22.0		" 8 12a
103	1526			3.5		" 9 1a
104	1527			1.0		" 10 2a
105	1528			19.5		" 11 3a
106	1529			21.0		" 12 4a
107	1530			7.0		" 13 5a
108	1531			5.5		" 14 6a
109	1532			26.0		" 15 7a
110	1533	↓	↓	15.0	↓	" 16 8a

DATE H. O'Bryan 6-17-71 Analysis for: Cu

SHIFT 1st Limit of detection: .03 PPM

Monsanto [illegible] Pollution Studies

	SAMPLE	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT	METHOD OF ANALYSIS	REMARKS
	Mice #			PPM		Fig. 6
111	1534	Cu	1	2.5	AA	Sj 9p 17
112	1535	↓	↓	1.8	↓	" 18 10p
113	1536			1.8		" 19 11p
114	1537			2.2		" 20 12p
115	1538			2.5		" 21 1p
116	1539			2.5		" 22 2p
117	1540			1.7		" 23 3p
118	1541			1.5		" 24 4p
119	[illegible]			.9		S. 1 5p
120	1543			.9		" 2 6p
121	1544			3.5		" 3 7p
122	1545			31.0		" 4 8p
123	1546			80.0		" 5 9p
124	1547			63.0		" 6 10p
125	1548			23.0		" 7 11p
126	1549			9.5		" 8 12p
127	1550			1.2		" 9 1a
128	1551			43.0		" 10 2a
129	1552			6.8		" 11 3a
130	1553			8.0		" 12 4a
131	1554			4.2		" 13 5a
132	1555	↓	↓	2.8	↓	" 14 6a

DATE H. O'Bryan 6-12-71 Analyze for: Cu

SHIFT 1st Limit of detection .03 PPm

Monsanto Brook (Water Pollution) Samples

	SAMPLE Misc #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT PPm	METHOD OF ANALYSIS	REMARKS Fig 7
133	1556	Cu	1	37.0	AA	Sa. 15 7a
134	1557	↓	↓	25.0	↓	" 16 8a
135	1558			15.5		" 17 9a
136	1559			7.0		" 18 10a
137	1560			13.0		" 19 11a
138	1561			8.2		" 20 12a
139	1562			1.2		" 21 1p
140	1563			1.8		" 22 2p
141	[illegible]			1.7		" 23 3p
142	1565			4.5		" 24 4p
143	1566			1.5		SAD 1 4^30 p
144	1567			1.4		" 2 5^30 p
145	1568			.8		" 4 7^30 p
146	1569			4.5		" 5 8^30 p
147	1570			8.0		" 6 9^30 p
148	1571			32.0		" 7 10^30 p
149	1572			12.5		" 8 11^30 p
150	1573			6.0		" 9 12^30 a
151	1574			4.5		" 10 1^30 a
152	1575			6.2		" 11 2^30 a
153	1576			16.0		" 12 3^30 a
154	1577	↓	↓	3.8	↓	" 13 4^30 a

DATE H. Bryan 6-17-71 Analysis for: Cu

SHIFT 1st Limit of Detection: 03 PPM

Monsanto Bridge Plate (Pollution) Lab

	SAMPLE (Misc) #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT PPM	METHOD OF ANALYSIS	REMARKS Page 8
155	1578	Cu	1	3.4	AA	SAD 14 5:30
156	1579	↓	↓	3.0	↓	" 15 6:30
157	1580			7.0		" 16 7:30
158	1581			11.0		" 17 8:30
159	1582			9.5		" 18 9:30
160	1583			2.8		" 19 10:30
161	1584			26.0		" 20 11:30
162	1585			15.0		" 21 12:30 p
[illegible]	[illegible]			18.0		" [illegible] 1:30 p
164	1587			33.0		" 23 2:30 p
165	1588			8.0		" 24 2:30 p
166	1589			4.2		SD 1 5:30 p
167	1590			2.5		" 2 6:30 p
168	1591			1.2		" 3 7:30 p
169	1592			1.2		" 4 8:30 p
170	1593			4.5		" 5 9:30 p
171	1594			.6		" 6 10:30 p
172	1595			1.0		" 7 11:30 p
173	1596			.2		" 8 12:30 a
174	1597			8.8		" 9 1:30 a
175	1598			8.0		" 10 2:30 a
176	1599	↓	↓	10.1	↓	" 11 3:30 a

DATE H. O'Bryan 6-17-71

Analyzed for: Cu

SHIFT 1st

Limit of Detection: 03 PPM

Monsanto Creek (Water Pollution Samples)

	SAMPLE Misc #	SPECIES OR PROPERTY ANALYZED	NUMBER OF RUNS	RESULT PPM	METHOD OF ANALYSIS	REMARKS Page 9
177	1600	Cu	1	19.0	AA	SD 12 4 30 a
178	1601	↓	↓	10.0	↓	" 13 5 30 a
179	1602			.2		" 14 6 30 a
180	1603			.2		" 15 7 30 a
181	1604			.1		" 16 8 30 a
182	1605			.1		" 17 9 30 a
183	1606			.1		" 18 10 30 a
184	1607			.1		" 19 11 30 a
185	[illegible]			.1		" 20 12 30 p
186	1609			.3		" 21 1 30 p
187	1610			.1		" 22 2 30 p
188	1611			.1		" 23 3 30 p
189	1612	↓	↓	.1	↓	" 24 4 30 p

Paul Jandler

RICHARD B. ~~OGILVIE~~
Governor

CLARENCE W. KLASSEN
Director

STATE OF ILLINOIS

ENVIRONMENTAL PROTECTION AGENCY

SAUGET - Sewage Treatment Works

January 19, 1971

President and Board of Trustees
Village Hall
Sauget, Illinois 62206

Gentlemen:

January 6, 1971, the Illinois Pollution Control Board adopted revised standards and requirements for waste water treatment for all discharges to the Mississippi River.

Secondary treatment is now required by December 31, 1973, in accordance with the enclosed copy of the Regulation, R70-3. It is suggested that planning and engineering proceed as soon as possible.

For communities over 10,000 population it may take 21 to 24 months to construct facilities after contracts are signed. An additional 6 to 9 months is needed for State review of engineering plans, bidding, evaluation and contracting.

Smaller communities should schedule start of construction by December 31, 1972, with engineering completed by July 1972. In all cases preliminary engineering and financing arrangements are needed. A proposed time schedule should be submitted to this office.

Very truly yours,

C W Klassen

C. W. Klassen
Director

Enclosure

cc: Region II

In the New Illinois, we accommodate!

2200 CHURCHILL ROAD
AT 2400 WEST JEFFERSON
SPRINGFIELD, ILLINOIS 62706
AREA CODE 217-525-3397

C311-61

ILLINOIS POLLUTION CONTROL BOARD

#R70-3: Secondary Treatment Dates, Mississippi River

(As Adopted January 6, 1971)

I. SWB-12 and 13 are hereby amended as follows:

1. Repeal the regulations found in paragraphs 7 of Rule 1.07 of SWB-12 and of Rule 3.01 of SWB-13 and in its place substitute the following:

"All oxygen-demanding waste discharges and wastes containing suspended solids shall receive a minimum of secondary treatment, as defined herein, by December 31, 1973.

"For sewage works which receive influent equal to or greater than 10,000 population equivalents (P.E.), secondary treatment shall mean that degree of treatment which will result in at least a 90% reduction in five-day biochemical oxygen demand (BOD_5) and suspended solids and provide an effluent which contains no more than 20 mg/l of five-day biochemical oxygen demand (BOD_5) and 25 mg/l of suspended solids.

"For sewage works which receive an influent of less than 10,000 population equivalents (P.E.), secondary treatment shall mean that degree of treatment which will result in at least an 85% reduction in five-day biochemical oxygen demand and suspended solids and provide an effluent which contains no more than 30 mg/l of five-day biochemical oxygen demand (BOD_5) and 37 mg/l of suspended solids.

"Disinfection will be provided for all effluents to reduce fecal coliforms to 400 per 100 ml or less before discharge to any waters designated for primary contact or to 2,000 per 100 ml before discharge to any other waters.

"Bypass flows in excess of sewage works capacity shall be given primary treatment and disinfection in auxiliary facilities.

"Any dates appearing in this regulation which are inconsistent with the December 31, 1973 date are hereby repealed."

2. Repeal the regulations found in paragraphs 11 (a) and 11 (b) of Rule 1.07 of SWB-12 and Rule 3.01 of SWB-13.

II. Rules and Regulations SWB-4 are hereby repealed.

1/26

Paul,
Natici same meeting
on 2/16 has different
starting times?

STATE OF ILLINOIS
POLLUTION CONTROL BOARD
189 WEST MADISON STREET SUITE 900
CHICAGO, ILLINOIS 60602

TELEPHONE
312-793-3620

DAVID P. CURRIE, CHAIRMAN
SAMUEL R. ALDRICH
JACOB D. DUMELLE
RICHARD J. KISSEL
SAMUEL T. LAWTON, JR.

NEWSLETTER #13
January 14, 1971

MARQUETTE CEMENT PENALIZED

In PCB70-23, the Illinois Pollution Control Board granted a one-year variance to the Oglesby, Illinois plant of Marquette Cement Manufacturing Co. But the Board took a hard look at the cement company's one and one-half years of corporate dalliance during which virtually no effort was made to control its excessive emission of cement dust and imposed a $10,000 fine.

Marquette requested and was given eight additional months in 1968 in which to file a plan for installing air pollution controls. In January, 1969, Marquette gave written assurances that it would initiate construction by May 1, 1970 and complete the installation of its control equipment by September, 1971. On the basis of these assurances, the Board approved the company's control program.

At this point Marquette's tactics take on an air of defiant procrastination. Despite state certification of the control plan, the company's directors voted only "conditional approval" of the program, effectively placing it at the mercy of financial "arrangements". In May, 1969, Marquette informed the Board that it would submit a new control proposal. No program was ever proposed. In September, 1969, the company flippantly observed that after two and one-half years of studying alternatives, it was right back where it started. In October, 1970, Marquette filed a petition for variance.

The control program as now approved appears to be adequate. But as the opinion by Mr. Currie observes, the Board cannot view lightly Marquette's "thumbing its corporate nose at the State of Illinois."

C311-62

The penalty should stand as warning that, while the Board intends to be reasonable with those who demonstrate good faith in submitting and complying with particulate emission control programs, those who defy the state's pollution law, throwing the heavy burden of their dilatoriness onto the public, will receive harsh judgment.

(Copies of the opinion are available from the Clerk of the Board at cost.)

MISSISSIPPI SECONDARY TREATMENT DATE SET

At its Edwardsville meeting on January 6, the Board set an example for other states to follow in adopting secondary sewage treatment for the Mississippi River. The Board adopted December 31, 1973 as the deadline for such treatment along the Illinois portion of the River, reflecting its belief that the economic and technical capacity exists for compliance within three years.

Some concern was expressed over the Federal government's approval of 1975 as the compliance date for the State of Missouri. Perhaps the Illinois example will prompt Missouri to accelerate.

An explanation and a copy of the new regulation is attached.

FOUNDRY TO IRON OUT PARTICULATE PROBLEM

On the basis of a showing that to deny its variance request would impose an unreasonable hardship (throwing 1,200 persons out of work) and that its time schedule for compliance with Illinois particulate emission standards is the fastest technically feasible, Wagner Castings received a variance until January 5, 1972.

While the Decatur foundry emits substantial amounts of iron dust, as the Board's opinion by Mr. Lawton states, petitioner has been operating in good faith pursuant to an air contaminant emission reduction program; and the plan which the company proposed in its variance petition will greatly accelerate the installation of pollution-free equipment.

The Board set a $50,000 bond as a condition to the variance.

POLLUTION CONTROL BOARD STEPS INTO MORE HOT WATER

In response to a citizens' petition proposing a thermal effluent standard for the Quad-Cities Nuclear Power Plant at Cordova, the Board voted to broaden the proposed regulation to include the entire Illinois portion of the Mississippi River and to schedule public hearings.

The Board is now considering thermal standards for Illinois' two major bodies of water - Lake Michigan and the Mississippi River.

The proposal, #R70-16, for all discharges into the Mississippi River is as follows:

1. No heated effluent shall exceed the naturally-occurring temperature of the river at any time or place by more than 5 degrees Fahrenheit.

2. No heated effluent shall exceed the naturally-occurring monthly high or maximum temperature of the receiving waters.

PHOSPHATE RESTRICTIONS ADOPTED

In what Messrs. Currie and Dumelle termed a "substantial step" toward saving Lake Michigan, the Board approved a phosphate effluent standard for Lake Michigan, Wolf Lake and the Calumet River lakeward of the O'Brien Locks.

By December 31, 1971, affected sewage treatment plants must remove approximately 90% of the phosphate from their discharges. Phosphate removal to this degree is feasible, requires relatively little investment in time and money and serves to retard the growth of algae blooms at greater than present bulk water levels -- the fate which befell Lake Erie.

The new regulation excepts unavoidable combined sewer overflows during the interim period before their complete elimination. A further explanation and a copy of the revised regulation are attached.

MOVE TO TIGHTEN RIVER WATER QUALITY STANDARDS

At its January 6 meeting, the Board voted to schedule hearings on two proposed revisions in the water quality standards applicable to the Mississippi and Wabash Rivers.

Proposed regulation R71-1 would revise SWB-9,which covers the interstate waters of the Wabash River Basin to include the North Fork of the Vermilion River. This change, which was requested by both the U. S. Environmental Protection Agency and the Illinois Environmental Protection Agency, would add the communities Rossville and Hoopeston to those required to meet the waste treatment standards contained in SWB-9.

R71-2 would revise the Mississippi River Standards to extend to the entire river the prohibitions on turbidity and inorganic solids which had applied to only a part of the river. The revision would also add a limit for dissolved solids identical to that specified for other rivers in Illinois.

The proposed revisions, if adopted, will enable Illinois to obtain Federal approval of its water quality standards and eligibility for approximately forty-two million dollars this year in Federal assistance for the construction of sewage treatment facilities.

A copy of the proposed regulations is attached.

AGENDA FOR JANUARY 20 MEETING

The Board's next formal meeting will be held on January 20, at the Circle Campus of the University of Illinois, 750 South Halsted Street, Chicago, Illinois. A tentative agenda for that meeting is:

(1) Decisions in the following cases:

EPA v. Amigoni, PCB70-15;
EPA v. Charlett, PCB70-17;
EPA v. Truax-Traer, PCB70-10; and
EPA v. Glendale Heights, PCB70-8.

(2) Hearings on Open Burning Regulations, #R70-11.

(3) Hearings on Air Quality Standards Revisions, #R70-10.

NEW CASES FILED AND HEARINGS AUTHORIZED

#70-15, EPA v. Amigoni; defendant in the enforcement case seeks a variance to permit the operation of an open dump. The variance petition has been consolidated with the enforcement action.

#70-49, EPA v. Koppers Co., seeks a cease and desist order and money penalties for alleged water pollution from creosote wastes and other contaminants discharged from the Carbondale plant. A hearing will be scheduled.

#70-50, Lipsett Steel v. EPA; seeks a variance until June 31, 1971 to continue the open burning of railroad box cars until an incinerator can be installed at the salvage operation. Petitioner's old variance expired December 31, 1970, but it did not file for a new variance until December 28, 1970, making impossible any Board action before the expiration date. Petitioner is now in violation of the law. Such untimely filing is to be discouraged. A hearing will be scheduled.

#70-51, Marschall Division, Miles Laboratories, Inc. v. EPA; requests a variance to use 2700 tons of coal containing 1.14% sulphur during air pollution episodes. The Air Pollution Episode Regulations require the use of coal having 1% or less sulphur during yellow and red alert stages.

After receipt of the EPA's recommendations, the Board will vote on the petition without a hearing.

#70-52, Marblehead Lime v. EPA; requests a variance until March 15, 1971 to complete the installation of a fiberglass bag house to capture particulate emissions. Petitioner's old variance expired December 31, 1970. The present untimely petition was filed on December 28, 1970. A hearing will be scheduled.

#70-53, Mid-State Foundry v. EPA; asks for a variance until March 15, 1971 to install an air filter scrubber to control particulate emissions. The request is the result of delays in equipment delivery beyond petitioner's control. The Board will proceed without a hearing.

#70-54, Vallence v. EPA; requests a variance to conduct the open burning of land refuse. The Board postponed scheduling a hearing until the Open Burning Hearings, #R70-11, are completed.

#70-55, City of Springfield v. EPA; asks for a variance of one year for the Horse Creek Sewage Treatment Plant so as to permit the City to discontinue the Horse Creek Plant, transferring its loads to the Springfield Sanitary District. A hearing will be scheduled.

#70-56, Tekton Corporation and Gallagher and Henry v. EPA; seeks a variance until May 1, 1972 with respect to water quality standards applicable to the Marion Brook Sewage Treatment Plant, operated by DuPage County. A variance would permit petitioners, real estate developers, to connect new housing units onto the Plant pending an expansion by May, 1972 which would enlarge the treatment facility sufficiently to handle the added load. A hearing will be scheduled.

ILLINOIS POLLUTION CONTROL BOARD

Notice is hereby given that the Illinois Pollution Control Board has scheduled the following hearings in addition to those previously announced along with changes of scheduled meetings as described.

Feb. 11	7:00 p.m.	Taft High School, 5625 N. Natoma Ave., Chicago, Illinois: Hearing on Airport Noise Standards, #R70-13. This hearing was previously scheduled for Resurrection High School, but is now changed.
Feb. 16	10 a.m.	SIU, Edwardsville: Revised Mississippi River Water Standards.
Feb. 16	9 a.m.	City Hall, Carbondale, Ill: Malibu Village Land Trust v. EPA, #PCB 70-45
Feb. 19	9 a.m.	Council Chambers, City Hall, Springfield: City of Springfield v. EPA, #PCB 70-55.
Feb. 24	10 a.m.	City Hall Council Chambers, 1528 Third Ave., Rock Island: Mississippi River Thermal Hearings, #R70-16.
March 5	10 a.m.	Council Chambers, 400 N. Hazel, Danville: Hearing on Effluent Standards #R70-8; Wabash River Basin Revisions, #R71-1.
March 24	10 a.m.	City Council Chambers, City Hall, 101 E. Third, Alton: Mississippi River Thermal Hearings
Feb. 11	10 a.m.	Hot Memorial Center, 810 N. State St., U. of Ill. Monticello, Ill: Glenbrook Laboratories v. EPA, #70-46
Feb. 23	10 a.m.	Granite City: Lipsett Steel Products Co. #70-50 (location to be announced)

ILLINOIS POLLUTION CONTROL BOARD

COMING FORMAL MEETINGS AND HEARINGS

Jan. 20	10 a.m.	Board Meeting, Chicago Circle Campus, 750 S. Halsted St., Chicago
Jan. 20	11 a.m.	Circle Campus, 750 S. Halsted St., Chicago: Hearing on Air Quality Standards Revisions, #R70-10.
Jan. 20	11:30 a.m.	Circle Campus, 750 S. Halsted St., Chicago: Hearing on Open Burning Regulations, #R70-11.
Jan. 20	10 a.m.	Town Hall, 4936 West 25th Place, Cicero: Continued hearing on Greenlee Foundries, Inc. Petition for Variance, #PCB 70-33.
Jan. 21	10 a.m.	Lecture Hall, Field Museum, E. Roosevelt Road and South Shore Drive, Chicago: Hearing on Effluent Standards, #R70-8. (Public should use west door of the museum for free admission)
Jan. 22	10 a.m.	Meyer Zone Center, East Mound Road (Middle Parking Lot), Decatur, Illinois: Hearing on Norfolk and Western Railway Co. v. EPA #PCB 70-41.
Jan. 23	10 a.m.	Office of the Pollution Control Board, 189 W. Madison St., Chicago, 9th Floor: Continued hearing on Commonwealth Edison Co. Dresden Unit 3, Permit application, #PCB70-21.
Jan. 26	10 a.m.	Circle Campus, 750 S. Halsted St., Chicago: Hearing on Mercury Standards, #R70-5.
Jan. 28	10 a.m.	City Hall, 419 Fulton, Peoria: Hearing on Effluent Standards, #R70-8.
Jan. 29	10 a.m.	City Hall, 1528 Third Ave., Rock Island: Hearing on Effluent Standards, #R70-8.
Feb. 3	10 a.m.	DeKalb: Board Meeting (location to be announced)
Feb. 4, 5 and 19	10 a.m.	Circle Campus, 750 S. Halsted St., Chicago: Hearing on Chicago Implementation Plan, #R70-15.

Feb. 5	10 a.m.	Village Office, 27 Riverside Road, Riverside: Hearing on Des Plaines River Water Quality Standards, #R70-12.
Feb. 9	10 a.m.	Municipal Building, 9545 Belmont Ave., Franklin Park: Hearing on Des Plaines River Water Quality Standards, #R70-12.
Feb. 11	7 p.m.	Taft High School, 5625 N. Natoma Ave., Chicago: Hearing on Airport Noise Standards, #R70-13. This hearing was previously announced as being held at Resurrection High School, which is now changed to Taft.
Feb. 12	10 a.m.	Circle Campus, 750 S. Halsted St., Chicago: Hearing on Airport Noise Standards, #R70-13.
Feb. 16	10 a.m.	SIU, Edwardsville: Hearing on Effluent Standards, #R70-8.
Feb. 16	11 a.m.	SIU, Edwardsville: Revised Mississippi Water Standards, #R71-2.
Feb. 17	10 a.m.	SIU, Carbondale: Coal Mining Wastes.Board Meeting.
Feb. 19	10 a.m.	Council Room, Village Hall, 4548 Grand Avenue, Gurnee: Hearing on Des Plaines River Water Quality Standards, #R70-12.
Feb. 24	10 a.m.	City Hall Council Chambers, 1528 Third Ave., Rock Island: Mississippi River Thermal Hearings, #R70-16.
March 3	10 a.m.	Board Meeting, Peoria Public Library, Peoria: Topic: Illinois River
March 5	10 a.m.	400 N. Hazel, Council Chambers, Danville: Hearing on Effluent Standards, #R70-8; Wabash River Basin, Revisions in SWB-9; #R71-1.

March 17	10 a.m.	Board Meeting, Bloomington (location to be announced)
March 24	10 a.m.	City Council Chambers, City Hall, 101 E. Third, Alton: Mississippi River Thermal Hearings, #R70-16.
April 14	10 a.m.	Board Meeting, Champaign (location to be announced)
April 28	10 a.m.	Board Meeting, Rockford (location to be announced)
May 12	10 a.m.	Board Meeting, Centralia (location to be announced) Topic: Oil Well Pollution
May 26	10 a.m.	Board Meeting, Charleston (location to be announced) Topic: Sludge Utilization
June 9	10 a.m.	Board Meeting, Danville (location to be announced) Topic: Strip Mines
June 23	10 a.m.	Board Meeting, Chicago Circle Campus, 750 S. Halsted St., Chicago.

In addition to the regular scheduled meetings, the Board holds informal meetings every Monday, beginning at 10:00 A.M., at the Board Office, 189 West Madison St., Chicago.

ILLINOIS POLLUTION CONTROL BOARD

Revisions of Wabash River Basin

Standards (SWB-9)

(Proposed January 6, 1971)

Amend SWB-9 as follows:

1.) Add ", and the North Fork Vermilion River" to the end of paragraph two of Rule 1.01.

2.) Add "North Fork Vermilion River," after the words "Wabash River" in paragraph a of Rule 1.02.

3.) Add "North Fork Vermilion River", after the words "Vermilion River," in the first sentence of paragraph two of Rule 1.08.

4.) Add "city of Hoopeston-population 7275-North Fork Vermilion River - Combined and Separate Sewers-Need Tertiary Treatment and chlorination by July, 1972" to timetable on page 9.

5.) Add "Village of Rossville - population 1470 - North Fork Vermilion River - Combined Sewer - Need Tertiary Treatment and chlorination by July, 1972" to timetable on page 9.

R71-2

ILLINOIS POLLUTION CONTROL BOARD

Revisions of Mississippi River Standards for Turbidity, Dissolved Solids and Inorganic Solids

(Proposed January 6, 1971

Amend SWB-12 and 13 as follows:

1.) Add to Rule 1.04 of SWB-12 the following:

"e). Dissolved solids:
Not to exceed 500 mg/l as a monthly average value nor exceed 750 mg/l at anytime."

2.) Add to Rule 1.05 of SWB-13 the following:

"13. Dissolved Solids
Not to exceed 500 mg/l as a monthly average value, nor exceed 750 mg/l at anytime."

3.) Add to Rule 2.05 of SWB-13 the following:

"12. Dissolved Solids
Not to exceed 500 mg/l as a monthly average value, nor exceed 750 mg/l at anytime."

4.) Repeal section a of paragraph 8 of Rule 2.05 in SWB-13 and in its place substitute the following:

"a. There shall be no man-made deposits of organic or inorganic solids on the stream bed."

5.) Add to Rule 2.05 of SWB-13 the following:

"13. Turbidity
There shall be no turbidity of other than natural origin that will cause substantial visible contrast with the natural appearance of or interfere with any legitimate uses of the stream."

6.) Add to Rule 1.03 of SWB-12 the following:

"e). Free from turbidity of other than natural origin that will cause substantial visible contrast with the natural appearance of or interfere with any legitimate uses of the stream."

ILLINOIS POLLUTION CONTROL BOARD

#R70-3: Secondary Treatment Dates, Mississippi River

(As Adopted January 6, 1971)

I. SWB-12 and 13 are hereby amended as follows:

1. Repeal the regulations found in paragraphs 7 of Rule 1.07 of SWB-12 and of Rule 3.01 of SWB-13 and in its place substitute the following:

"All oxygen-demanding waste discharges and wastes containing suspended solids shall receive a minimum of secondary treatment, as defined herein, by December 31, 1973.

"For sewage works which receive influent equal to or greater than 10,000 population equivalents (P.E.), secondary treatment shall mean that degree of treatment which will result in at least a 90% reduction in five-day biochemical oxygen demand (BOD_5) and suspended solids and provide an effluent which contains no more than 20 mg/l of five-day biochemical oxygen demand (BOD_5) and 25 mg/l of suspended solids.

"For sewage works which receive an influent of less than 10,000 population equivalents (P.E.), secondary treatment shall mean that degree of treatment which will result in at least an 85% reduction in five-day biochemical oxygen demand and suspended solids and provide an effluent which contains no more than 30 mg/l of five-day biochemical oxygen demand (BOD_5) and 37 mg/l of suspended solids.

"Disinfection will be provided for all effluents to reduce fecal coliforms to 400 per 100 ml or less before discharge to any waters designated for primary contact or to 2,000 per 100 ml before discharge to any other waters.

"Bypass flows in excess of sewage works capacity shall be given primary treatment and disinfection in auxiliary facilities.

"Any dates appearing in this regulation which are inconsistent with the December 31, 1973 date are hereby repealed."

2. Repeal the regulations found in paragraphs 11 (a) and 11 (b) of Rule 1.07 of SWB-12 and Rule 3.01 of SWB-13.

II. Rules and Regulations SWB-4 are hereby repealed.

ILLINOIS POLLUTION CONTROL BOARD

#R70-6: Phosphorus Regulations

Approved January 6, 1971

PREAMBLE

Phosphorus is an element which is a nutrient for algae. Present Federal and State policies for Lake Michigan include the control and reduction of phosphorus in order to limit the production of algae. Algae causes tastes and odors in water supplies and may reduce dissolved oxygen in water. Algae is a nuisance to swimmers and can reduce the enjoyment and property values of shore line property.

The present standards for phosphorus in the water of Lake Michigan are at levels which are thought to be those to which algae blooms will occur and greater than present bulk water levels. The new standard is 2/3 of the former standard. An effluent standard is added to provide a control on phosphorus discharges to Lake Michigan.

1. Water Quality Standard. Existing Board Regulations specifying water quality standards for Lake Michigan, Wolf Lake and the Calumet River (lakeward of the O'Brien Locks) are hereby amended to provide that the concentration of total phosphorus measured on unfiltered samples in these waters shall not exceed 0.02 mg/l as phosphate (PO_4) or 0.007 mg/l as phosphorus (P).

2. Effluent Standard. Except for unavoidable combined sewer overflows during the interim period before their complete elimination, no effluent to the waters of Illinois listed in Section 1 above, shall include phosphorus in excess of 3.0 mg/l as phosphate (PO_4) or 1.0 mg/l as phosphorus (P) after December 31, 1971. Dilution of effluents shall not be an acceptable alternative to treatment. Where water is added to streams of waste water and cannot be reasonably separated, then its quantity shall be measured and effluent concentrations recomputed to exclude its diluting effect.

3. Testing. All testing pursuant to the Regulations herein provided shall be made using methods as listed in either "Methods of Chemical Analysis of Water and Wastes", November, 1969, Federal Water Quality Administration, or, "Standard Methods for the Examination of Water and Wastewater," Twelfth Edition, 1965.

4. Effective date. Except as specifically provided in Section 2 of these Regulations, the requirements of these Regulations shall be met within ten days after filing with the Secretary of State.

OTHER ADDRESSEES • FOR INFORMATION

cc: W. Graff
File 1104 (2)

CERRO COPPER & BRASS COMPANY

DIVISION OF **CERRO CORPORATION**

INTERNAL MEMORANDUM

Form HQ-10 SHOW NAME, TITLE AND CORPORATION OF ADDRESSEE AND ADDRESSOR

TO: W. E. Dunnick, Vice President DATE: March 20, 1970

P. Tandler, Technical Manager
FROM: R. O. Wigger, Development Manager

SUBJECT: SANITARY DEVELOPMENT & RESEARCH ASSOCIATION MEETING
MARCH 16, 1970

In accordance with your request, the writers attended the meeting of the Sanitary Development and Research Association Board and Village of Sauget Board of Trustees to hear the oral presentations from several engineering firms invited to discuss the plans for secondary treatment of industrial and municipal wastes in the Village of Sauget.

The five companies made their presentations and answered the questions in accordance with the outline proposed in a letter to each engineering firm, sample copy of which is attached hereto.

A. Russell & Axon Joint Proposal With Aquatechnics

Russell & Axon, represented by Mr. O. E. Grewis, Vice President, indicated that they would be the principal engineering firm in this joint venture with Aquatechnics of Chicago, Illinois, represented by Mr. Harris Dicker, Manager, at the meeting. Aquatechnics is a division of Westinghouse Electric Corporation devoted to the study and design of water pollution control systems and specializing in metal wastes, according to Mr. Dicker.

Russell & Axon has installed sewer and treatment facilities at the Shell Oil Refinery, Roxana, Illinois, Falstaff Brewing Co., Alton Boxboard Company, City of Woodriver, City of Kabool, Mo., and City of Belleville. In some instances, the projects involved combined treatment of industrial and municipal wastes. Their organization is located in St. Louis, Missouri and Daytona Beach, Florida and employs some 100 trained personnel.

Aquatechnics, who employ 22 people, have performed work at the Bethlehem Steel Corporation plant at Burns Harbor, Michigan (a $70,000,000 project), Jones and Laughlin Steel Company, Reynolds Metals, Inland Steel Company, and U. S. Steel Company at Gary, Indiana.

C311-63

The scope of engineering services includes:

1) Review of existing plant data.
2) Field investigation and treatability.
3) Pilot study on site.
4) Design engineering and report.
5) Work with state and federal authorities for approval, grants, etc.
6) Detailed planning.
7) Preparation of bid documents.
8) Overseeing of construction.
9) Preparation of operating instructions.
10) Starting up of facility.

Several alternatives for engineering fees are available including:

1) Actual payroll costs times multiplier of 2.5 plus non-salary type expenses
2) Lump sum payment
3) Percent of construction cost
4) Cost plus fixed fee

They indicated that the first phase of the project which includes the review of existing data, field investigations, pilot study, and the preparation of a design engineering report should be handled under the first fee method described.

With respect to the guarantees suggested in the letter of invitation, Mr. Grewis offered a general statement which, in fact, neatly sidestepped the question of a performance guarantee. He also failed to indicate to what extent the preliminary examination of plans and primary treatment plant indicate the usability of the present facility as part of a secondary treatment plant. A letter addressed to the Board of Directors has been attached to the general file. This letter outlines in greater detail the proposed services of Russell and Axon and Aquatechnics.

B. Horner and Shifrin

This consulting firm was represented by Mr. F. E. Wisely, Vice President and Mr. George Sallwasser, Principal Associate. The firm, organized in St. Louis in 1933, has approximately 60 engineers on their staff. They propose complete engineering services in conjunction with the proposed project. Mr. Wisely reviewed the extent of their participation on sewer work and related projects done in the St. Louis area over the years. A great deal of their work has been concentrated on the East Side much of which has been for the East Side Levee and Sanitary District and the Village of Sauget. Other definitive studies have been made for the Metropolitan St. Louis Sewer District. Industry clients have included Anheuser-Busch,

National Lead, Monsanto Company, Missouri Portland Cement, Absorbant Cotton Company, Cupples Products Company, General Steel Industries, Mallinckrodt Chemical, and Royal Packing Company.

Work for the Village of Sauget began in the 1940's and the latest report was prepared in 1965. However, only portions of the 1965 study have been put into actual practice. A copy of Horner and Shifrin's letter addressed to the Board of Trustees and Association is attached to their brochure and the detailed outline of their services is contained in this letter and will not be repeated here. The rough outline of their services is as follows:

1) Review of current status related to sewerage and treatment, quality and flow, and predictions by industry as to future quantities and nature of effluents.
2) Special studies including laboratory work, on-sight studies, and pilot plant work.
3) Establishment of design objectives working with the Village, the Illinois Sanitary Water Board and Industries.
4) The evaluation of alternate plans.
5) The development of a recommended plan including estimates of capital and operating costs, grant possibilities and financing, construction program.
6) The preparation of plans and specifications.
7) Assistance in the bidding procedure.
8) Overseeing of construction.
9) The preparation of operating manuals.
10) Acceptance tests and functional and process testing.

With regards to fees, they gave several alternatives similar to the first firm's presentation, but indicated they would prefer the salary rates time a multiplier for the definitive engineering work.

In regard to the existing facilities, Mr. Wisely felt the sewer system and pumping plant facilities were inadequate for present or future flow quantities and would need to be enlarged and improved. With regards to the utilization of the present primary treatment plant, he indicated that it should be usable in "some way".

As to a time table for the project, he indicated that the definitive engineering work would take 1 to 1½ years, design engineering - 1 year, and construction and start-up - 2-2½ years, indicating a total time span of 4-5 years. Reference was made to the fact that the present deadline for the State of Illinois for the completion of secondary treatment facilities was 1982, but the national trend was to shorten the available period considerably and, as the State of Missouri has recently adopted December, 1975 as a deadline, it would not be unlikely that the State of Illinois will follow a similar schedule.

With respect to performance guarantee, Mr. Wisely indicated that no comprehensive guarantees can be offered as this type of performance guarantee is not the customary practice of independent, professional engineering organizations. He suggested that the best manner for obtaining such a guarantee is by assuring ourselves of the competence of the consultants and contractors.

C. Sverdrup and Parcel

Sverdrup and Parcel was represented by Mr. L. E. (Bill) Johnston, Senior Vice President, William H. Rivers, Vice President and Chief Engineer, and Dr. Henry G. Schwartz, Jr., Manager of Environmental Design Group (Project Mgr.).

This engineering firm located at St. Louis with offices in other principal cities employs some 500 people. A brochure which is in our files adequately describes their background and qualifications to perform this work and also includes a network diagram for the process, preliminary, and final design of the proposed secondary treatment plant in Sauget, Illinois. S & P has a wide background of heavy industrial and public facilities design work and listed several clients among those whom waste treatment facilities had been designed. They included Granite City Steel Company, Armour Pharmaceutical Company, PPG Industries, Crystal City, Missouri, Staley Manufacturing Company, Morrisville, Pa., Metropolitan St. Louis Sewer District, and City of Jacksonville, Fla. They also indicated some several dozen sewer and pumping station projects in various other areas. The project plan and organization are adequately described in the brochure available and will not be outlined in this brief.

As to fees, all four methods covered in the earlier presentations are available and they suggest, as did others before them, that the process design and preliminary engineering work should be conducted on the basis of salaries times a multiplier of 2. The final design and project supervision fees can be discussed.

As to performance guarantees, Sverdrup and Parcel indicated that they did not deem this type of guarantee applicable to a project of this sort. However, they indicated that they carry Errors and Omissions (E & O) insurance to the extent of $10,000,000., and that they felt their clients were adequately covered by this form of protection.

With respect to time table, they indicated a 4-5 year completion and also referred to the possibility of a 1975 date for compliance in the State of Illinois.

As a final point, they indicated that although they considered their organization completely competent to conduct this work, they had discussed the possible participation of a firm like Ryckman, Edgerly, Tomlinson, & Associates, Inc., St. Louis, in this project should the client desire such participation. They felt that this sort of joint venture, although S & P would be fully responsible for the project, would be a possibility for the process design and the engineering phase of this project at the client's discretion.

D. Ryckman, Edgerly, Tomlinson, & Associates

This firm of consulting engineers, specializing in water, solids, and air pollution engineering work was represented by Dr. D. Ryckman, President, Mr. H. D. Tomlinson, Vice President, and Mr. J. Dieterman, Associate. The firm, founded in recent years, is located in Clayton, Missouri and has some 30 active members although they count many additional people in other organizations and educational institutions as part of their resource specialists available to serve clients. Dr. Ryckman made the presentation and the essence of his remarks is contained in a brochure, part of the file. In essence, the plan breaks down into three phases:

1) Process design
2) Engineering plans and construction
3) Start-up

The experience of the firm include some 47 waste treatment plant projects, however, the speakers were reluctant to discuss the names of their clients but indicated that they would furnish them on request. Apparently, they have been requested to observe certain secrecy agreements for clients who did not wish their plans discussed publicly and have extended this aura of secrecy to their other clients as well.

With respect to performance guarantees, Dr. Ryckman and Dr. Tomlinson indicated that they would guarantee that regulatory agencies would be satisfied with the results of the project but cannot issue specific guarantees as to water quality at this time or at least until the closer criteria of design can be developed.

The fee schedules were touched on briefly and are contained in the brochure. The time table presented by them breaks down into four phases:

1) Before plans and specifications - some 15 months
2) Preparation of plans and specifications - 12 months
3) Construction and start-up - 18 months

Some additional time is allocated between these phases for time required for the approval of plans and specifications and the bidding process. Inasmuch as there is some overlapping between construction and start-up, the total elapsed time for the project is estimated at 48 months. The gentlemen indicated that they would be prepared to cooperate with other consultants or engineering firms in developing the necessary program if it should be the association's wish to have another firm involved in any particular phase of the project. They did indicate, however, that they are prepared to take the entire project into their organization.

It may be recalled that our company invited R.E.T.A. recently to submit their proposal for measuring flow and determining metals concentration in various sewers of the St. Louis Works. This project has been held in abeyance awaiting the development of the Association's plans. We are also considering at this time the use of this firm for testing various stacks where air pollution control projects have been completed.

It was apparent from the presentation, the material submitted, as well as the reputation of this firm that they represent the highest standards of engineering competence and would undoubtedly do an excellent job in determining the design criteria for a treatment plant. The writers feel, however, that the responsibility for the engineering design and construction phases of the project should be placed with a firm somewhat better experienced in these areas.

E. Biodize Systems, Incorporated

This firm, located in New York and Chicago, Illinois, is a division of the Monsanto Co. known as Monsanto Biodize Systems, Inc. The firm was represented by Mr. Elmer L. Boehm, President, Mr. F. Rogers, Vice President, Mr. Bill Haase, Director of Marketing, and Mr. Chet Knowles, Director of Commercial Technology. A brochure directed to the Associations Board and Village Board of Trustees is part of the file available in our offices. It describes in detail the nature of the organization, the clients whom they have served, and the plan which they would follow in pursuing our project. A slide presentation indicating their qualifications and laboratory facilities, together with completed installations was made.

Biodize will guarantee that the facility constructed will perform in accordance with agreed upon performance specifications during a test period following plant start-up, providing the characteristics of the raw waste fall within the limits established by the parties and

providing that Biodize is engaged to conduct laboratory and field investigations in order to establish the basis for the design. If deficiencies should occur when the plant is operational, these will be corrected at Biodize's expense.

A complete schedule of engineering fees too lengthy to outline here was submitted in the written proposal.

Biodize presented the name of a number of clients for whom they have performed similar work. However, none of these appeared to be large installations and it is apparent that they are a thoroughly new organization with a fresh approach to the matter of waste water treatment and some of their methods may be as yet unproven in the field and on larger installations. We could not detect any experience in waste treatment plants receiving the waste products of several industries together with municipal waste.

SUMMARY:

The presentations were most interesting and educational for the participants particularly those of us who have not been involved in discussions on secondary treatment. It was apparent that the Board members and participants from the Monsanto Company who outnumbered the other companies were most interested in the highly technical aspects such as treatability of wastes. One can surmise that the local people concerned with plant waste treatment or monitoring have given this some thought and that they were testing the applicants to see what expertise they were prepared to offer in this very important phase of process development.

The Board of the Sanitary Development and Research Association is taking these presentations and proposals under advisement.

VILLAGE OF SAUGET

SANITARY DEVELOPMENT AND RESEARCH ASSOCIATION

SAUGET, ILLINOIS 62201

March 3, 1970

Mr. W. H. Rivers
Vice-President
Sverdrup & Parcel and Associates, Inc.
800 N. 12th Boulevard
St. Louis, Missouri 63101

Dear Mr. Rivers:

The Village of Sauget requests that you make an oral presentation regarding the study and design of a secondary waste treatment plant at the Village Hall, Sauget, Illinois on March 16, 1970 at 3:00 P.M.

The presentation should be conducted according to the following agenda:

1. Introduction

   a. General organizational make-up.
   b. List and briefly discuss industrial treatment plants in operation that you have completely engineered.

2. Scope of Engineering for Village Project

   a. Itemize and describe work to be performed on a phase basis.
   b. List personnel to be assigned:

      1. Project Principal
      2. Project Manager
      3. Process Engineer
      4. In-plant reduction specialist.

3. Itemize Alternate Methods for Computing Engineering Fee.

Included in the scope should be a statement pertaining to a "Performance Guarantee" covering plant operations and the limits or boundaries placed on such.

Also, prepare a "Cost Table" summarizing unit costs for all personnel assigned to the project. This may be distributed as a handout at the oral presentation.

The oral presentation will be to both the Village of Sauget Board of Trustees and the Village of Sauget Sanitary Development and Research Association's Board of Directors. Therefore, the engineering scope should include a discussion of the present Village sewers and treatment plant, possible modification and/or improvements required, and how they can be incorporated into the secondary treatment facilities. All parties are highly interested in seeing the present treatment plant utilized; thus, reducing future capital expenditures.

You will be allotted one hour of which the first thirty minutes should be oral presentation followed by thirty minutes for questions and answers.

If I can be of further service, please contact me at (618) 271-5835, Extension 2671.

Sincerely,

Michael A. Pierle

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